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Organization Replaces Sensation in Making Car Announcements

Thorough analysis and careful planning characterize campaigns in 1923. Dealer's needs are being considered and his interests are being protected. Novelties are not lacking, but do not play important part they once did. Methods help reduce sales cost.

By Norman G. Shidle

NEW models are holding the automotive spotlight at the present time. The annual quota of construction changes is being announced. Several innovations already have made their appearance and more are on the way. Some companies are presenting models that differ considerably from 1922 lines both in appearance and in technical details, while others are simply adding refinements to former chassis and bodies.

Whether changes have been great or small, however, the work of "putting over" these new jobs again is focusing attention on merchandising methods and marketing costs. In the well-known "once-upon-a-time" the advent of a new model caused a ripple on the pond of public opinion just by the mere fact of its coming out. Many people were interested to find out if it would run, if nothing else. Then, as the powerplant became reliable and the appearance more graceful in all kinds of cars, a new design had to have some very striking points to attract much general attention. Engineering development was not rapid enough, naturally, to provide some unique feature every twelve months. The motor car gradually grew into the economic and social fabric of the country. A new model ceased to be a curiosity and became a piece of necessary merchandise. For it, as for other pieces of merchandise, publicity and sales effort were required to attract attention.

When these three Graces were put to work in the interest of new cars they had virgin soil in which to work. Just as it had been relatively easy for the engineer to make radical changes in the early stages of car development, so novel merchandising ideas were not so hard to get in the beginning.

Publicity stunts which attracted countrywide attention ten and twenty years ago would hardly cause a passing comment from the blasé car prospect of 1923. There used to be many more new things under the sun in automotive publicity and merchandising than there are today. Sensational methods and novel ideas once were plentiful enough to generate the necessary selling force when a new vehicle appeared.

TIMES have changed. Careful organization and thorough analysis are required in the successful announcement of new cars today. Study of methods used by those companies which have obtained maximum results from recent announcements shows a minimum of sensation and a maximum of organization. Elements of Barnum psychology are still used to help arouse interest in the new product, but they are subordinate to a basic plan comprising carefully thought-out methods of bringing the new line to the attention of as many people as possible. They are the icing of 1923 merchandising methods, where once they constituted most of the cake.

The need for such careful executive work in making car announcements came about gradually; so gradually that it had arrived before some companies recognized it. In the early days the requirements of the manufacturer were of major importance in determining the time and methods to be used in announcing the new product. Today dealers' needs receive primary consideration.

THERE was a time not so long ago when factories brought out new models without considering the fact that their dealers had on hand a considerable stock of old cars; when factories shipped in new models without regard to the status of the used car market or the dealer's ability to handle the additional units; when factories, by national advertising, created a demand for a new model and then were unable to supply dealers with it, despite the fact that demand for the old had been killed.

Happily these conditions have passed. At least they are conspicuous by their absence this year. This may be due partly to the fact that a rather brisk demand has kept dealer floors pretty clean. Strong evidence exists, however, to indicate that the better conditions are due primarily to a new understanding on the part of manufacturers as to dealer needs. One company, for example, is said to have had its 1924 model ready for some three months before actually announcing it to the public. The dealers were told about it in advance and were given this 90-day period in which to clear their decks for action.

Similar provisions seem to have been made in the case of nearly all the new models announced thus far this year. The groundwork for putting over the new model successfully was laid within the organization before general publicity and advertising efforts were begun. The adoption of this general policy on the part of manufacturers undoubtedly will have a favorable effect in stabilizing dealer organizations and in cutting down factory selling costs. It indicates a clear conception throughout the industry of the importance of building and maintaining the dealer organization on a sound and permanent basis.

Actual merchandising helps for the dealer have been developed to a marked extent in recent years. They aid him in building a firm marketing foundation for future sales effort, especially when correlated with the consideration of dealer needs already mentioned. Unlike sensationalist methods, the selling effort which has accompanied recent announcements is an integral part of the general and permanent marketing plan by which the product is being distributed.

An important part of these modern methods consists in "selling" the new model to the dealer as well as to the public. Manufacturers, viewing the retailer as a more potent selling force than ever before, are decreasing their total sales cost per unit by attempting to sell their dealers very strongly on new models and then helping them to sell the car to the consumer. Consumer advertising by manufacturers is tying up more and more closely with local dealers.

Many companies have given very definite and specific helps to their dealers in putting over their recent models. In addition to regular consumer advertising, dealers have been provided with posters, novelties and selling ideas of various kinds. One company gave its dealers twenty specific helps in connection with the announcement of a new model. These were provided at a very low cost and were carefully worked out to be of maximum practical assistance in retail selling.

The factory is usually in a better position to think out merchandising plans of this kind than is the average dealer. A good dealer, one might say, would think of various merchandising schemes himself, but it must be remembered that the average dealer's experience and vision is relatively limited.

The live factory sales department collects ideas and hints from various parts of the country. It has an opportunity, available to few dealers, of watching how various plans work out in different territories. It can select the most successful ones and broadcast them throughout the retail organization. Factory selling costs are decreased rather than increased by providing assistance of this kind. By helping the dealer to get off on the right foot with a new model the factory saves itself much future trouble.

It keeps dealers from getting loaded up with unsold stocks of cars; it makes possible the absorption of normal quotas by a majority of the dealers, and thus helps materially to stabilize the factory production schedule.

Efficient aid to dealers when a new model goes out also saves traveling expenses for factory representatives at a later date. It isn't so likely to be necessary to send someone down

to Podunk to find out why the dealer there isn't moving the Snowbird as fast as he should. The careful thinking and planning that has preceded the announcement of several recent models will undoubtedly be a factor in reducing unit sales costs at the end of the year. The situation is one which involves another application of the old adage about a stitch in time.

MANY novel selling ideas have been evolved in connection with the campaigns recently put over. But novelty has not been the outstanding feature of recent developments along this line. The big thing that impresses the student of these campaigns is the increased application of analysis, planning and organization. Sales departments as well as production departments are being "tooled up" before the go-ahead signal is given.

It has become common practice to call important distributors to the factory many weeks before a new design is to be announced and to go over with these men various plans which are being considered. Every effort has been made lately to put some of the new models in every part of the country, so that public display will coincide exactly with public announcement.

These methods help materially to increase the confidence of dealers in the factory organization and to make them feel that their interests are being guarded in various other merchandising developments. The effect of well organized announcements is cumulative throughout the year.

THE systematic planning which has characterized automotive production for many years is gradually finding its way into the efforts of the sales department. This tendency is illustrated admirably by the organization and analysis work which has preceded the announcement of new models this year.

All of the returns are not in yet, but there is every indication that more careful thinking has preceded merchandising activity than ever before and that the needs of the individual dealer are being considered much more fully than in the past.

Paris Buses Test Efficiency of Alcohol as Engine Fuel

Experiments show 50-50 mixture with Benzol best from dual standpoint of stability and economy. Product should be of highest purity to reduce oxidation and carbonaceous deposits.

EXPERIMENTS with alcohol mixtures as motor fuel, made by the Paris General Omnibus Co. and its successor, the Public Transport Co., of the Paris Metropolitan District, were recently reviewed in a paper presented by M. Peridier before the Societe des Ingenieurs Civils. From these experiments the following conclusions were drawn:

Mixtures of alcohol and benzol are suitable motor fuels. As regards the use of low grade gasoline or kerosene, mixtures of this fuel with alcohol containing from 40 to 45 per cent of alcohol give results similar to, though slightly less satisfactory than, those of the 50-50 alcohol-benzol mixture.

The author finally considers the validity of the claim that, technically, alcohol is the best motor fuel. He says that it necessitates the use of products as pure as possible; it possesses a lower heat value than either gasoline or benzol, both from the volumetric and the gravimetric standpoints, and it has a low vapor tension at normal temperatures and a very considerable viscosity. On the other hand, it permits increasing the compression rate of the engine, and thus its thermal efficiency, which improvement is still further increased by its high latent heat of vaporization.

Best Mixture Found

For engines of the type used by the omnibus company the consumption with the 50-50 alcohol-benzol mixture is 25 per cent greater than with pure benzol, which entails additional work of handling the fuel. It will thus be seen that while alcohol presents certain advantages from a technical standpoint, its practical use is not without some disadvantages.

Experiments date from June, 1906, when the motors of the Paris Omnibus Co. were operated on the Lepretre mixture (50 per cent alcohol, 50 per cent benzol). Results were satisfactory, but it was found to be necessary to preheat the fuel mixtures and to clean periodically the filters of the fuel tanks and the carbureters. No attack of either the cylinders or the pistons was observed. Later tests showed the 50-50 mixture of benzol and alcohol to be the best from the dual standpoint of stability and economy.

After the war tests were made with an alcohol-benzol-gasoline mixture, with Natalite (52.3 per cent alcohol, 47.7 per cent ether), the E. H. A. mixture (65 per cent alcohol, 10 per cent ether, 25 per cent benzol), and the Lance mixture (60 per cent alcohol, 15 per cent ether, 25 per cent turpentine). The results obtained were not sufficiently satisfactory to warrant the use of these fuels.

In 1920 the Public Transport Co. resumed experiments with fuel mixtures of an alcohol base, by determining for each mixture the most favorable compression ratio. Mixtures containing less than 35 per cent of alcohol were eliminated by reason of their instability.

For mixtures containing from 35 to 65 per cent of alcohol it was found that the consumption increased between 11 and 40 per cent as compared with pure benzol. It was thus found that for the H-type of engine, when supplied with the 50-50 mixture, the best compression ratio is 6.4, and the fuel consumption with this compression is about 10 per cent less than with the normal compression of 4.55. A similar series of tests were made on the PB-2 engine. To complete this research the conditions of stability of the mixtures were investigated by drawing the diagrams of crystallization, and exhaust gas analyses were made.

Encouraging Results

In June, 1921, the engines of one of the omnibus lines were operated on the alcohol-benzol mixture and the results were encouraging. On the other hand, the movement in favor of a national fuel induced Government authorities to insert in the specifications governing the sale of German benzol the condition that an equal quantity of alcohol must be taken. The company then generalized the use of the 50-50 alcohol-benzol mixture, and since Aug. 15, 1922, all of the omnibuses in operation have been run on that fuel. The necessity for double pre-heating was confirmed again, and after a few days deposits were noted in the fuel tanks, the fuel piping and the inlet pipes. The surfaces of the pistons, cylinders and valve heads were not attacked in any way.

In spite of some untoward incidents in operation the company decided to continue the use of the fuel and set out to discover the mechanism of the depositions. Experiments showed that certain metals, such as tin, lead, copper and brass, resist the attack better than pure zinc, sheet iron, carbon and nickel steel.

Recent Bench Tests

In December, 1921, the use of alcohol of 95 per cent as a component of the fuel mixture became general and it has been exclusively employed ever since without notable incidents. Since that time the omnibuses have covered 40,000,000 miles. The fuel consumption is at the rate of 1 U. S. gallon per 3.94 omnibus miles, while with pure benzol it is at the rate of one gallon per 4.92 omnibus miles, or 20 per cent less.

Quite recently the company made a series of bench tests with various fuels, anticipating a possible interruption in the supply of benzol from Germany. These included 90 per cent alcohol, alcohol-benzol-ether acetylene dissolved in an alcohol-benzol mixture, alcohol-benzol-kerosene-phenol, alcohol-benzol-gasoline in equal quantities. Particular attention was given to mixtures of kerosene and anhydrous alcohol, the latter in the proportions of 10, 15 and 50 per cent. Both on the bench and in service mixtures with a low alcohol content (10 and 15 per cent) gave only half satisfactory results.

Proper Study of Weight Distribution Essential to Correct Brake Design

Part 1

Three purposes must be considered: bringing car to full stop, keeping it at low speed while going down hill, and holding it in position on up-grades. Calculation of braking elements frequently neglects important variables. Accuracy is needed.

By P. M. Heldt

THE brakes of a motorcar may be said to serve three distinct purposes, namely, to bring the car to a stop, to prevent it from attaining too high a speed on steep down grades and to hold it in position on grades. The brakes of practically all cars are adequate for ordinary uses, but there are two extreme conditions under which some, if not a good many, fail. These conditions are that of an emergency stop (when the car must be brought to a standstill in the shortest possible distance), and that of a long, steep descent in mountainous country. There are, of course, no standards for the effectiveness of the brakes under either of these conditions. That is, no one can say, for instance, that a car must have a certain decelerating power and that more than this is superfluous. Whether it is a matter of bringing a car rapidly to a stop from high speed or holding it in control on a steep grade, the factor of safety is always involved and it would seem that brakes could not possibly be too powerful. On the other hand, the brakes depend for their action upon the adherence of the wheels to the road surface, and this puts a natural limit to the braking power.

The development of automobile engineering on the one hand and of automobile traffic on the other, have made necessary greater braking power than that which was considered adequate for the earlier cars. The speed limits attainable with modern cars on modern roads are very much higher than those of a decade ago and the average speeds maintained probably are also considerably higher. Another factor that calls for increased braking power is the increasing congestion of our streets and roads. Where

the traffic is sparse there is seldom need for making a quick stop, while in our most congested metropolitan thoroughfares the brakes have to be applied at frequent intervals and often with considerable energy.

Usual Practice Described

In the past it has been customary to calculate the distance in which a vehicle can be brought to a stop from a given initial speed on the assumption of a constant decelerating power. For instance, if the brakes act through the rear wheels and these wheels carry 60 per cent of the total weight, then with a coefficient of adhesion of 0.6, the maximum retarding force per 1000 lb. total weight is evidently

$$1000 \times 0.6 \times \frac{60}{100} = 360 \text{ lb.}$$

Now we know that a force of 1000 lb. imparts to a mass of 1000 lb. an acceleration or a deceleration of 32 ft. p.s.p.s., hence a force of 360 lb. imparts to a mass of 1000 lb.

$$\frac{360}{1000} \times 32.16 = 11.55 \text{ ft. p.s.p.s.}$$

If we are traveling at an initial speed of 30 m.p.h., which is equal to

$$\frac{30 \times 5280}{3600} = 44 \text{ ft.p.s.,}$$

it evidently takes

$$\frac{44}{11.55} = 3.6 \text{ seconds,}$$

in which the car comes to a stop, and inasmuch as the speed decreases uniformly with respect to time, the average speed during the stopping period is one-half the initial speed and the distance in which the car is brought to a stop is

$$\frac{3.6 \times 44}{2} = 79 \text{ ft.}$$

This method of arriving at the distance in which a car can be brought to a stop by means of the brakes will be seen to be very simple, but, unfortunately, the result is based upon two assumptions—that of a certain distribution of the total weight between front and rear wheels, and that of a certain road adherence. Both of these factors vary within rather wide limits and the minimum stopping distance varies correspondingly.

In reality the problem of the stopping distance is considerably more complicated than would appear from the above discussion. In the first place, the reaction between

THIS is the first of a series of articles by P. M. Heldt discussing important phases of brake design.

The recent appearance of four-wheel brakes on several American cars has centered engineering attention on motor car brakes of all kinds. Definite efforts are being made to improve braking qualities without unduly increasing manufacturing costs.

In the accompanying article Heldt points out some of the inaccuracies that often appear in calculating the efficiency of various brake elements and shows how to take care of some variables which are involved.

the rear wheels and the ground when the brakes are in action and the car is in motion is not the same as when the car is at rest, but is considerably reduced by the virtual transference of weight from the rear to the front wheels by the reaction to the braking torque. In the second place, the maximum braking effect is not that represented by the sliding friction of the rear wheels on the ground and, thirdly, a considerable retarding effect is produced at high speed by the air resistance, which is not constant, but varies as the square of the speed.

The transfer of weight from the rear to the front wheels when the brakes are applied to or through the rear wheels may be investigated with the aid of the diagram Fig. 1. Let W be the total weight of the car, acting vertically downward at the center of gravity, and l_1 and l_2 the horizontal distances of the center of gravity from the centers of ground contact of the front and rear wheels respectively. Then for the condition of rest the reaction between the front wheels and the ground is

$$r_1 = \frac{Wl_2}{L},$$

L being the wheelbase, and the reaction between the rear wheels and the ground is

$$r_2 = \frac{Wl_1}{L}.$$

Now suppose that the brakes are applied so that the rear wheels slide on the road, with a friction coefficient μ . Then, neglecting the resistance to the rolling of the front wheels, which is small in comparison with the sliding friction of the rear wheels, the ground reactions will now be R_1 and R_2 , and there will be a propelling force $R_2\mu$ active at the center of gravity. Taking moments around the center point of ground contact of the front wheel,

$$Wl_1 - R_2L - R_2\mu h = 0$$

$$Wl_1 = R_2L + R_2\mu h$$

$$R_2(L + \mu h) = Wl_1$$

$$R_2 = W \left(\frac{l_1}{L + \mu h} \right)$$

Also, since

$$R_1 + R_2 = W$$

$$R_1 = W - W \left(\frac{l_1}{L + \mu h} \right) = W \left(\frac{L + \mu h - l_1}{L + \mu h} \right)$$

The amount of weight virtually shifted from the rear to the front wheels by rear wheel braking therefore is

$$r_1 - R_1 = \frac{Wl_2}{L} - \frac{Wl_1}{L + \mu h} = \frac{Wl_2\mu h}{L_2 + L\mu h}$$

In order to convey an idea of what this really amounts to, we may apply the formulæ to a practical case. Suppose we have a car whose loaded weight W is 3600 lb. and which has a wheel base L of 125 in. Let l_1 be 65 and l_2 60 in., and let the coefficient of adhesion μ be 0.6. Also, let the height of the center of gravity above the road be 30 in. Then the rear wheel ground reaction r_2 for the condition of rest is:

$$\frac{3600 \times 65}{125} = 1872 \text{ lb.,}$$

whereas the real wheel ground reaction R_2 for the braking condition is

$$\frac{3600 \times 65}{125 + (0.6 \times 30)} = 1636 \text{ lb.}$$

Hence the transfer of weight in this particular case amounts to

$$1872 - 1636 = 236 \text{ lb., or}$$

$$\frac{236 \times 100}{1872} = 12.6 \text{ per cent.}$$

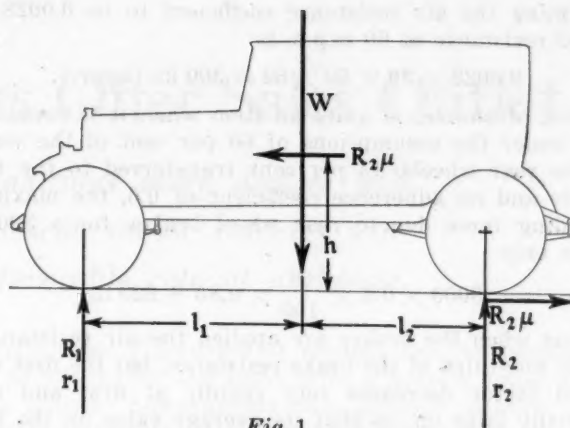


Fig. 1
Diagram of forces and reaction on chassis
when brakes are applied

It will be seen that the shifting of weight depends upon the height of the center of gravity above the ground. The lower the center of gravity, the less will be the shifting of weight, and the more effective, therefore, the rear wheel brakes.

Looking at the matter in a different way, the application of the brakes to the rear wheels creates a braking torque reaction around the rear axle axis which in the case just considered amounts to

$$\frac{236 \times 125}{12} = 2460 \text{ lb.-ft.,}$$

the direction of the reaction being such as to press the forward end of the car down. When brakes are applied to act on the front wheels there is created a brake-torque reaction which tends to raise the rear end of the car, and in cars with very short wheelbase, this involves an element of danger. For instance, with electric cabs with front wheel drive and braking it has happened that when the brakes were suddenly applied on a rather steep down grade the whole cab turned over forward. This is a parallel to the case of a farm tractor with rear drive, which is apt to turn over backward if the power is suddenly applied, especially on a steep upgrade. However, with gasoline cars of normal proportions and on grades up to the maximum steepness found on regularly traveled highways, there is no danger from this cause.

Whereas this virtual transfer of weight from the front to the rear wheels decreases the braking power which can be exerted through the rear wheels, the other two factors mentioned as affecting the brake power increase it. The first of these depends upon the fact that the brakes are more effective just before reaching the point of becoming locked than when actually locked. At the very point, just before the locking occurs, the difference is equal to the rear wheel rolling friction and the rear axle friction. This is only about 4 per cent of the sliding friction, but that slight gain cannot be realized in practice with ordinary forms of brake design, because no driver, however skillful he may be, is able to apply the brakes with exactly the right amount of pressure to just keep them from sliding. Brakes have been designed in which locking is prevented by automatic action, but this involves so much complication that most engineers would not consider them worthwhile. The only real advantage we derive from this principle is that for an instant just before the brakes lock, retardation takes place at this slightly increased rate.

The other factor referred to is the air resistance. This resistance is present at all times, provided there is no wind in the direction of the car's motion of a higher velocity than that of the car. However, it is of appreciable value only at considerable speed. The average full sized car has a wind resistance area of about 30 sq. ft.

Better City Planning Needed to Solve Serious Traffic Problems

Congestion is great in many urban areas. Question is just as important in small cities as in larger ones. Car and truck sales will be affected materially in the future. Automotive industry should take an active part in bettering conditions.

By Alvan Macauley
President, Packard Motor Car Co.

THE possibility of a physical saturation point for automobiles in cities and the urgent need of measures to cope with traffic congestion have increased the interest of the automobile industry in city planning. This interest must become action very soon if more serious conditions are to be avoided. The automobile industry and our cities are growing so fast that apparently insoluble and intolerable problems develop almost overnight. And they are problems which must be solved, for their toleration means loss of life and money and a handicap to the effective development of the industry.

It must be admitted that we—the automobile industry—have been so concerned with "next year's model" that we have forgotten that it would have to run on last generation's streets—and generally on streets built on the 1682 model—when William Penn laid out the first checkerboard street plan for Philadelphia. We have been so busy boosting highways to take a man from one city to another that we have given no thought to what happens when he gets there. But now we must add to the slogan of "Good Roads" one of "Better Streets."

The conditions are obvious to any man who tries to drive his car through any city of any size—the greater the size, the more obvious. Traffic congestion has come to be taken for granted. There is constant discussion of it—and constant refusal to do anything to prevent it—only occasionally, when conditions become impossible, some remedial measures are undertaken. In the busiest centers of many cities many automobile owners no longer use their cars, as they can make better time walking. And we should remember that the automobile industry depends not only on the sale of cars but also on the use of them.

Accident Increase

The automobile industry can take little pride in the figures which show that the number of fatalities per car has been decreasing annually. The fact that the number of fatalities per 1000 population has been steadily increasing from .0887 in 1917 to .1334 in 1922 is of far more serious importance. But neither group of statistics can prove of great comfort to a widow or a bereaved mother. In New York City population increased about 50 per cent in twenty-five years—traffic deaths multiplied about five times. Now 2000 policemen—one-sixth of the force—in New York are detailed to traffic duty.

But to the fifty-odd millions living in cities the heavy toll is wasted time and the cost of transportation and the cost of living due to traffic congestion is even more important than accidents. What difference does it make to the man on Fifth Avenue, New York, if his car can "do" sixty miles an hour or if he is limited to ten or fifteen

miles if he can only go about three and a half miles an hour? (It was only 1.7 miles an hour before the traffic towers were installed.) Where is the economy of truck haulage if hours are wasted in loading and unloading and in traffic jams? A horse can stand still just as easily as a truck—and more economically. And in many cities the result is that millions of dollars annually are added to the cost of food by improper transportation in the city—it costs more to move food once it gets into town than it does to bring it from a hundred miles out.

Streets Are Inadequate

It is not "passing the buck" for the automobile industry or the automobile owning public to say that the fundamental traffic problem is not in the automobile or the driver but in the street. The vast majority of streets in all the cities of any size in the country were simply not built for the automobile traffic they now bear or will have to bear in the next few years. And this includes not only the narrow choked streets in the business sections but also the wide deserted streets in some of the residence sections—there is no relation between street and traffic.

We may grin broadly at the story of how New York was planned, but with children killed every day and millions of dollars to be spent in street widening and changing we wonder on whom the joke is. When, in 1807, New York streets had to be planned above Fourteenth Street, the eminent commissioners appointed got tired of endless discussions and arguments of special interests. One of them put a mason's wire screen on a map of the city and said, "Here is the plan: the larger vertical wires will be the avenues and the cross wires will be streets." And so they were. And in about the same way were created most of the streets in the country today. Checkerboard and grid-iron plans predominate—they look as if they had been laid out by an industrious child with a tennis racket laid over a map, filling in the holes with a pencil. They are "paper" streets utterly indifferent to the needs of the city, the topography of the land, the cost of construction or the serviceability of the results. That is why we find rectangular streets built on steep grades in cities throughout the country from Albany to San Francisco; streets which no vehicle can use and which have steps for pedestrians. And that is why the business districts of so many cities are suffering from hardening of the arteries and high pressure of traffic circulation.

This lack of civic foresight should be charged against the people of this country. In recent years city officials in scores of cities and towns of all sizes have taken up city planning. Many excellent and some comprehensive plans have been prepared. But most of the plans have been

shelved and undesirable conditions continue and grow worse.

Every town—no matter how small—needs a city plan. Cities between 100,000 and 500,000 in population need it more than the others—and at once. Every city of this size has for a living lesson the twelve cities of larger population. They all aim to grow beyond the half-million mark and they will surely develop all the attributes of a metropolis, including the complete assortment of traffic evils, unless they do their utmost to prevent it.

There were, in 1920, fifty-six cities having a population between 100,000 and 500,000. The following table shows how many cities in various classes there have been at the last four census counts:

Population	Number of Cities			
	1920	1910	1900	1890
Over 1,000,000.....	3	3	3	3
500,000-1,000,000	9	5	3	0
250,000-500,000	13	11	9	8
100,000-250,000	43	31	21	15
	68	50	36	26

The very conditions which are driving city officials to desperate measures, which are killing and maiming increased numbers, which are taking the joy out of driving and the economy out of trucking, are growing up day by day in every one of the smaller cities. Cities, unlike children, not only have growing pains, but their pains increase as they grow—and they are never grown up. These conditions can be remedied more easily while a city is in the early stages of its development.

Of these 68 cities of over 100,000 here are the twelve which lead in the number of motor vehicles per square mile of area (figures of the N. A. C. C.), their present population and the approximate year in which they passed the 100,000 mark:

City	Motor Vehicles per sq. mi.	Population	Year Population Passed 100,000
Dayton, Ohio	1,885	152,559	1905
Detroit, Mich.	1,867	993,678	1876
San Francisco, Cal..	1,803	506,676	1865
Cleveland, Ohio ...	1,762	796,841	1871
Reading, Pa.	1,704	107,784	1914
Dallas, Tex.	1,695	158,976	1911
Milwaukee, Wis....	1,471	457,147	1877
Toledo, Ohio	1,454	243,164	1894
Akron, Ohio	1,448	208,435	1914
Bridgeport, Conn...	1,337	143,355	1909
Rochester, N. Y....	1,318	295,750	1882
Wilmington, Del...	1,277	110,168	1915

It is seen that of these twelve leading in vehicle density,

0	have a population over 1,000,000,
3	" " " 500,000 to 1,000,000,
2	" " " 250,000 to 500,000,
7	" " " 100,000 to 250,000,

and it is clear that the traffic problem is developing most intensely in those cities having less than half a million

population rather than over—and of these the 100,000 to 250,000 class is in most danger.

Conditions probably will be worst in the "newer" cities, as in this list seven out of the twelve passed the 100,000 mark only since 1890, six of them since 1900, and four since 1910. It is probably true that the cities over 100,000 in population are paying more attention to traffic control than the smaller cities—and yet in the N. A. C. C. "honor roll" for reducing motor fatalities in 1922, only thirteen of the forty cities were over 100,000 in size.

Changes Are Costly

The twelve cities with more than half a million population, as far as city planning goes, face a situation which would seem to be almost hopeless of change except at enormous cost. Those below half a million have some hopes and of these the cities ranging from 100,000 to 250,000 have the most hope of preventing evil. Also they are in greatest danger because automobile ownership is, of course, increasing more rapidly than population.

What can the automobile owner ask of the city planner? What can the city planner do to remedy existing situations and to prevent future ones? These are no new problems

to those engineers and architects who have devoted attention to city planning. And in the last decade, they have given more and more consideration to questions of street layout than to those earlier questions of "the city beautiful."

At the outset city planning must be distinguished from traffic control. There seems to be a prevailing tendency to confuse the methods and results of these two ways of coping with traffic situations. Traffic control involves rather the policing of traffic streams with men, mechanical devices or both. City planning involves the structural facilities of the streets themselves and their efficient adaptation to traffic needs.

The question as to what the streets should be used for would naturally receive very forceful and contrary answers from different people. The pedestrian and the street car companies would be inclined to have all automobiles impounded; the automobilist would like to eliminate the street car and force all pedestrians to stay in their own backyards. So that the question is rather as to what the streets are actually being used for—and these functions should determine the street layout of a city.

There is no doubt that the motor vehicle problem is the traffic problem, so that the functions of a street should be considered in relation to the automobile. The streets provide for:

1. Automobile traffic
 - a. Fast moving
 - b. Slow moving
 - c. Heavy trucking
2. Track vehicle traffic (street cars)
3. Horse-drawn and miscellaneous traffic
4. Pedestrians
5. Parking and stopping for loading and unloading
 - a. Cars
 - b. Trucks
6. Playing children

I. "Through"
II. "Local"

Those who object to the last classification will have to devise means for providing children with proper and adequate playgrounds; that is a city planning problem.)

It seems obvious to say that a street should be designed for the traffic it is to bear—and yet that is exactly what most streets are not. Not only do they not provide for the future, but a large proportion of them are totally unfit when they are built for the work they have to do.

It is the work of the city planner, therefore, to decide the nature and the extent of the traffic that is to move about the various parts of the city and to lay out the streets in relation to this movement; and to decide the nature and extent of the traffic which is to use each individual street and to base on these forecasts its width and other structural characteristics.

An increasing number of cities have found that it is not necessary merely to forecast their development, but also to control it. By means of "zoning" plans and regulations a city can, with flexibility and yet with conscious determination, decide in what directions it had best grow and for what purposes each section had best be used. Cities are also exercising increasing control over the plotting of suburban areas—the suburb of today becomes "the city" of tomorrow.

Simple Classification

The simplest classification of streets might be made in three groups:

- A. Arterial or main
 - a. Leading into and out of city, and through city
 - b. Tying the sections together, making them easily accessible to each other.
- B. Secondary—principal streets in sections of heavy traffic
 - a. Civic centers
 - b. Shopping district
 - c. Freight moving areas: wholesale, manufacturing, railroads, riverside and waterfront.
 - d. Office district (skyscraper area)
 - e. Amusement centers
- C. Residential streets
 - a. Detached houses
 - b. Rows of two- or three-family houses
 - c. Tenement and apartment houses

"THE fundamental traffic problem is not in the automobile or in the driver, but in the street. The vast majority of streets in cities were not built for the automobile traffic they now bear. We may grin broadly at the story of how New York was planned, but with millions of dollars to be spent in street widening and changing, we wonder on whom the joke is."

Each of these streets has different traffic needs and serves different types of neighborhoods. And yet without regard to these needs, without regard to the direction of population growth and without regard even to the topography of the land on which a city is built, the rectangular street plan has become standard in most of the cities of the country. It is true that this type of plan can be most economical in the use of the building area. It is also true that on flat land it makes for easily followed, straight streets.

But it is used in innumerable instances in areas which are hilly, necessitating expensive cuts and fills or excessive grades. The rectangular system does not provide the

most direct routes between all parts of a city. And it makes a city full of dangerous right-angle intersections. With all its apparent simplicity and open-faced honesty, the rectangular street system has been the villain of American city development.

The result has been many millions of dollars spent and many more proposed for the purpose of cutting diagonal streets across the rectangular ones. Not that the radial system is, in pure form, any better. Many cities blessed, or cursed, with a center, have found how expensive it is to have all streets lead to it. This becomes particularly vicious if the city is the center for much interurban traffic, as in Newark, N. J., which, in spite of its less than half a million population, developed the "second busiest corner" in the United States—the automobilist's and city planner's idea of nothing to be proud of.

Dangerous Spots

"Centers" of all kinds are danger spots. They develop inevitably, it is true, but they should be carefully watched and decentralized as soon as possible. As soon as a corner becomes busy steps should be taken to divert traffic which does not have to pass it. One of the most effective remedies for the busy corner in a rectangular system is the "diamond on the cross"—four streets cut at angles outside the corner, forming a diamond-shaped area. Another method is the creation of an open space such as a circle or a square. But these may be easily developed into huge and confusing traffic tangles which are almost impossible to police.

With the increase in interurban traffic, the streets which offer the most direct route through the city become important. Little attention has been paid to them. Good roads leading into a city are often traps from which the motorist cannot escape. Or else they pass right through the busy center of a city and the stranger has to suffer the same traffic agonies as the native. The cow-path of today becomes the Main Street of tomorrow and the Wall Street or Broadway of the day after tomorrow.

The railroad is another source of traffic difficulties which the busy boosting citizen, in his joy at having a railroad, never foresees. A railroad running through a city means a grade crossing at every street.

"Standardization" is a word of power in the automobile industry, but nobody tries to make the same standards serve for the motorcycle and the ten-ton truck. Yet in scores of cities the same standard street design is supposed to serve the quiet, exclusive residential street and the street in the skyscraper or shopping district.

Traffic Provisions

Not that the American city is stingy with its provisions for streets. The percentage of total area given up to streets was only 10 per cent in ancient and medieval cities—now it is 25 to 40 per cent. But because of standardization, many streets are not wide enough and many are too wide. It is, of course, a hundred times or a thousand times cheaper to build a wide enough street first than to tear down buildings in order to widen it afterward.

For most main thoroughfares a width of 100 feet should be effective, offering facilities about as follows:

Four lines of traffic.....	36 feet
Parking space at both curbs.....	16 feet
Double car tracks.....	20 feet
Sidewalks	28 feet
	<hr/>
	100 feet

Many famous streets are much wider than this, of course, and most streets need not and should not be so wide, but if we must standardize let us have this adequate

width at least for the main streets. This does not mean that 60-, 80- or 100-foot all paved streets should be provided which will not be used for many years. By the proper use of grass plots at the sides and of set backs, a flexible street may be designed which will provide the proper width of roadway as the traffic needs grow. And another point to which too little attention has been paid is the ratio of sidewalk width to roadway width, which should depend on the relative amount of pedestrian and vehicular traffic.

The street railway is, of course, a highly controversial subject. Those autoists who are tired of playing hide-and-seek with a street car on a busy street will feel better if they realize that the smaller cities probably will not have to pass through the trolley stage in such acute form, thanks to the bus, the jitney, the taxicab, and private cars.

All these considerations can guide the smaller growing city—but they are of little help to the city which has already grown too big. Leaving aside traffic control measures such as one-way streets, "silent policemen," safety zones, traffic policemen, traffic towers, parking regulations, etc., there are a number of remedial measures which involve reconstruction—sometimes at nearly prohibitive initial expense. Many of these costs, however, would be fully repaid by increased land values and improved traffic conditions. The principal ones are:

1. Widening and straightening of streets.
2. Elimination of encroachments.
3. Cutting new streets, providing detours, diagonals and decentralizing streets.
4. Elevated streets and subways.
5. Grade crossing elimination; belt line railroads.
6. Keeping all streets paved properly in busy sections so that traffic does not concentrate on the best streets.
7. Rerouting of street cars.
8. Eliminating backyard fences to provide playgrounds.

The problem of parking, another brain-racker brought by the automobile, is far from solution, even in undeveloped cities. It would be possible for a city to set aside automobile parks right in the sections where the retail

and office districts will develop, but it is doubtful how long such arrangements would prove economical as land values naturally increased. It may be that the only solution is street parking, for which wide streets are needed. The loading and unloading of trucks, particularly in industrial and commercial sections, is another problem. Incidentally, the truck body builders can help by providing side doors so that the length of a truck does not occupy the whole street width during the operations.

Children "do not have to" play in the streets, and the city plan should provide ample places for them to use. Fortunately the cities are more and more realizing this and providing parks and playgrounds. This problem may be solved some time if the city has foresight enough to set aside land where it is cheap so that it may become precious in the future.

Constructive Action Suggested

There are fifty-six bustling, thriving cities which are getting trouble ready for the automobile industry. These cities can be saved if the automobile owner, the automobile dealer and the automobile manufacturer want to save them. Every year means less chance and a greater toll of life and money. City planning used to be only the social worker's business—now it is very much the automobile industry's business.

Here is a very "simple" program for every automobile man in every one of those fifty-six cities—and the twelve larger ones:

1. Get all the official, civic and commercial organizations interested.
2. If there is no city plan or city planning body, get one. If there is, get behind it and make it real.
3. See to it that the proper surveys are made of conditions relating to automobiles. If nobody else will do it, it is the auto club's or the dealers' organizations' job.
4. Work to remedy present bad conditions and avoid future ones. The automobile industry five and ten and twenty-five years from now will depend on what you do today.

Rail Car Trucks Should Be Safety-Chained

By Donald Hampson

PRACTICALLY every small railroad is using rail cars in passenger service. An increasing number of trunk lines are doing the same thing. A majority of these cars have the drive on two or four wheels at the rear and a four-wheel leading truck in front. It is the function of this front truck to guide the car on entering a curve, to relieve the impact of flanges against the rail, and to promote safer riding generally.

It is conceded that a four-wheel truck is safer than a two-wheel, but neither of them are proof against derailling from such causes as track obstructions, defective switches, etc. It is for that reason that the trucks of rail cars should be chained.

When an unchained truck leaves the rails it is immediately freed from angular control and becomes subjective to roadbed conditions. For instance, the outer wheel is apt to encounter a projecting tie where the ballast slopes away to the ditch, while the inner wheel

travels along on a hard-packed surface ballasted full to the top of the ties. In consequence, the outer wheel stops long enough for the truck to pivot about it and turn the front end of the car sharp across the track.

In one particular case a horseshoe was lodged in the work at a road crossing. When the car struck this at 25 m. p. h. it broke the flange on the leading truck wheel, which then ran along the crossing planks, dropping off the end and striking a tie, with the result that the car turned crosswise and then turned over.

Had this front truck been adequately chained the car would have stayed in line. Ample proof of the difference between chained and unchained trucks is furnished by the behavior of passenger cars and freight cars when derailed or wrecked. The former are required to be heavily chained and invariably are found parallel with the track, while the latter (never chained) run crosswise more often than not.

Automobile Importers' Association Organized in Spain

New group will represent automotive interests in negotiations with government, will do sales promotion work, and help toward improving merchandising methods. Flat rate system is approved. Use of time payment sales is growing. Main highways are good.

By L. H. Schultz

ONE of the latest automotive developments in Spain is the organization of the Asociacion Nacional de Importadores de Automoviles with headquarters in Madrid. This body was organized only a short time ago and it now has about fifty members, among whom may be counted representatives of the leading makes of automobiles being used in this country.

As its first public work of importance, the association organized the automobile show which was held at San Sebastian, the best known summer resort of the country, during the latter part of July. Some twenty makes of cars were exhibited and, while some Barcelona distributors were unfortunately absent, the show was much larger and more important than the previous exhibition at San Sebastian last year.

Leaders of the new association, in announcing the San Sebastian show, stated that they wished to break away from the practice of holding only one show a year and that in the center of the country. It is their desire to have exhibitions in various sections in order to cover Spain more thoroughly than would be the case if only one central show were held at Madrid or Barcelona. Exhibitions at different periods of the year at Barcelona, Madrid, Seville, Cadiz, Santander, San Sebastian, and perhaps several other cities, will attract many times the number of visitors and result in a vastly increased number of sales. This is the view of some of the leading representatives who are closely studying and adapting as much as possible the best merchandising plans evolved within the industry.

Among the numerous purposes for which the association was organized are the following:

1. To have an organized body to represent the automotive industry in its negotiations with the governmental agencies in such matters as road building, taxation and import duties. In this work it has the close cooperation of the Real Automovil Club de Espana, a very powerful organization of some 1500 automobile owners.

2. The development and support of various movements to aid in selling automobiles and automotive products, such as a permanent exhibition or show center in Madrid and Barcelona. In addition, it plans the organization of

races and of similar contests which are popular here.

3. To secure cooperative benefits for its members. The association already has organized a commercial service for its members in Spain and will further develop this work. It is also arranging to carry insurance policies for its members and there has been consideration of cooperative advertising work. Every effort will be made, it is planned, to promote the automotive development of Spain, as the general feeling is that the automobile means progress and economic upbuilding of the country. Spain has economic possibilities of the greatest scope and the automobile will

be one of the most active agencies in developing them.

4. The organization will take steps looking to the organization of the merchandising methods within the industry so that dealers in automotive products will be able to make legitimate profits on their business. Owing to unfortunate practices which have crept into the trade, quite a few lines are carried by dealers without any profits to themselves. The association has its greatest opportunities in this direction and, likewise, its greatest work.

The formation of the association is perhaps one of the

most important steps recently taken by the Spanish automotive industry. It has an opportunity to develop automotive business in Spain along successful lines and keep it from the pitfalls that may threaten the individual business of each of its members.

Significant advances have been made in the past two years in reaching and developing a new class of automotive owners. By actively seeking sales among the farmers, fruit growers, wine makers and merchants in all parts of the country, the automobile is creating higher standards of living and comfort and is gradually building up the country in many ways.

THE automotive business is slowly being concentrated in the direction of more intensive sales efforts. Distributors are increasing the number of dealers and sub-dealers throughout nearly every section as rapidly as the financial arrangements can be made. The representatives for even the highest priced lines are finding more sales in the rural and provincial sections and they, as well as those

THE writer of this article, formerly with the Automotive Division of the Bureau of Foreign and Domestic Commerce, is now traveling in Europe studying certain specific phases of automotive development. He has prepared this special article for Automotive Industries after extensive conversations with leading importers and dealers in Spain.

Besides describing the activities of the new association recently formed there, he tells about the attitude of Spanish dealers toward the flat rate system, the use of time sales, and other important features of current automotive development.

handling the lower priced lines, are intensifying their dealer organizations. Service provisions are following this trend, of course, and service facilities are being expanded as rapidly as possible, particularly in the maintenance of stocks of repair parts. Some distributors say that within a few years they will be in position to adopt the flat rate plan of charging clients on repair work.

UNTIL a few months ago, practically all motor vehicles in Spain were sold on a cash basis with but little recourse to deferred payment methods. At that time, however, a company was organized with a capital of only 15,000 pesetas to finance the sales of Ford cars on a nine months' credit system. The company was heavily backed financially and evolved the plan of having the purchaser pay down 25 per cent of the price, paying the balance in nine monthly installments. A fee totalling about 300 pesetas was charged for the transaction. Many persons made the first payments but were unable to complete the purchase and the cars were turned back to the financing company. This was due, perhaps, to the fact that too liberal methods were followed, and for a time there was an unusually heavy number of used cars on the market.

Other dealers found it necessary to extend credit from time to time, which, however, they were obliged to finance themselves. The problem has now been worked out to the point where the financing organization is handling all lines of cars for the purchaser whose credit standing is fully and carefully investigated before the sale is permitted. Other finance companies probably will enter the field and the present management is being watched very closely to see if it turns out a certain success.

The used car situation is held to be critical in Spain at the present time, but undoubtedly importers have it within their power to prevent further troubles, once the present situation is cleared up. Some estimates state that 6000

used cars are now on the market but 4500 is perhaps closer to the actual number. Many of these cars are said to be in Barcelona, although they are spread all over the country to some extent.

The new importers' association perhaps will take up this problem and it may be that they can reach an agreement concerning allowances to be made by members. It should be possible to handle the situation throughout the entire country at this stage, if an agreement can be reached that includes the greater part of the automotive industry.

Truck sales are somewhat slow at the present time and a great number of military trucks coming from the army stocks of the European war are supplying most of the present needs. However, with the increased use by industrial companies, some improvement is being noted. The company building the Madrid subway, for instance, is using twenty or more trucks in hauling the dirt from its tunnels. Street conditions are somewhat unfavorable in some sections but heavy trucks are being used and distributors and dealers are watching this section of the industry closely.

ONE of the blackest clouds confronting the industry is the tariff situation, which is now somewhat confused due to pending treaty negotiations with several countries, particularly the United States. Automotive distributors are, of course, actively assisting in the present negotiations, which they hope will be successfully concluded before the present treaty expires early in November. Three schedules are provided under the new duties, treaty arrangements being necessary to obtain entry of automobile products under the lower rates. Failure of the present negotiations would necessarily bring about an increase in duties with a resultant increase in the sales price of the cars or trucks to the owners and users.

Public Libraries Seek Automotive Literature

PUBLIC libraries in the United States are eager to get interesting pictures that show how the automobile is used in transportation. They use them in making up loan collections which are utilized by pupils in the public schools in connection with regular studies and for all sorts of additional purposes. Pictures showing how automobiles are made are wanted also.

Miss Bernadine McLaughlin, librarian of the Hamilton Park branch at Normal Boulevard and Seventy-second Street, in Chicago, indicated the possibilities of disseminating information regarding the automobile industry through this new channel.

"From this branch—and it is only one of forty-odd branches in Chicago—we supply pictures to ten large public schools having a total enrollment of between 12,000 and 15,000 pupils. Besides, our pictures are borrowed by the students at the Cook County Normal School—the future teachers in the public schools. There is a growing demand for all sorts of pictures on the subject of 'Transportation' and we have not enough in our collection to meet the needs of the schools. We are interested not only in automotive transportation but every form, even to the primitive."

The question as to whether this matter is of interest in the smaller towns as well as in the larger cities is answered by Miss McLaughlin and Miss Alberta McDermott, librarian of the Blackstone branch, who say that it is rapidly growing in popularity in libraries all over the country.

What kind of pictures relating to the automotive world

are desired? Any that will interest and will fit in with regular school studies. If the youngsters in geography are studying a particular portion of the country and a particular product they want to know how the product is transported. Suppose they were studying about Detroit or any other automobile center, they would naturally take up the subject of the principal industries, and pictures showing the different steps in the manufacture of an automotive vehicle fit right in the progressive classroom.

The automotive industry benefits considerably from this work because it will not be long until these youngsters will be the men who have things to transport and will be buying automotive vehicles for that purpose. They will be the citizens who will need to know the value of automotive transportation and be interested in seeing that highways are maintained.

The pictures can be put into the libraries in such a manner that the manufacturer and possibly the local dealer will benefit. Here is the plan:

After the manufacturer has notified dealers that it has pictures which can be supplied to libraries—either actual photographs or interesting advertising material—let the dealer find out if the local library needs such pictures. Then if the library is glad to get them, let the manufacturer send two sets of the pictures. The dealer will present one set to the library. He will use the other set for a window display. This window display will be accompanied by a card explaining that it is a duplicate of the set furnished to the public library for use in teaching the facts about automotive transportation.

Rail Car Design Changes Are Suggested as Result of Operating Experiences

Passenger car engine preferred to truck power plant for some types of work, according to Motive-Power Engineer of Canadian National Railways. Gasoline electric type is making another bid for consideration after having failed fifteen years ago.

MOTOR propelled rail cars are not of recent origin, although the railroads have shown decided interest in them only during the past two or three years. Some fifteen years ago several internal combustion engine propulsion systems for rail cars were developed, notably gasoline-electric systems; after their original announcements little further was heard of them. During the past two years, however, many motor coaches have been placed in service, particularly on side lines where the amount of traffic is light. When the railroads first became interested, most of the cars placed in service were converted trucks or omnibuses; it does not require lengthy argument to prove that a better job can be produced if it is specially developed for rail work, and a good deal of development work along this line has been going on the past two years.

The subject of the railway motor coach was interestingly discussed in a paper presented at the Spring Meeting of the American Society of Mechanical Engineers at Toronto by C. E. Brooks, Chief of Motive Power, Canadian National Railways. Brooks said that high train-mile costs for small returns had forced railway officials to turn to the motor coach for relief in the following classes of service:

- Giving a frequent passenger service on sparsely settled branch lines or parts of main line adjacent to market towns or junction points.
- Connecting junction points on important main lines with the town or small city situated within a few miles of the main line.
- Giving a group of towns situated on a main line or important branch lines a frequent connecting service over and above through main-line trains.
- Connecting small summer resorts, golf clubs, etc., to branch line or through main-line service.
- Handling milk of a limited amount to a distributing or connecting point.
- Providing connections to small suburbs.

Gasoline-Electric Type Revived

The combination gasoline-electric systems of fifteen years ago proved a failure because of the imperfections of their engines, which entailed heavy maintenance cost and unreliable service; the complication of the equipment and the great weight of the coaches themselves. Steam coaches also were given a try-out, but they failed for substantially the same reasons. The gasoline-electric type is now again making a bid for this class of work, and there is little doubt that with a modern gasoline engine generating plant it has a chance of success.

Brooks divides the motor coaches used on railway lines into two classes, as follows:

Class A—A seating capacity of from 24 to 40 persons and provision for approximately 100 sq. ft. of baggage space. The light weight of such a car to be from 18,000

to 30,000 lb. maximum or, in other words, not to exceed 750 lb. per single seat (with baggage space) or 500 lb. per seat if no baggage space is allowed. In some classes of service the baggage space is given up and seating accommodation substituted.

Class B—Units seating from 40 to 60 passengers and providing for baggage space a minimum of 100 sq. ft. and a maximum of 200 sq. ft. As constructed these cars weigh from 800 to 1200 lb. per single seat, but it is thought that the weight must be kept down to the same limits as those prescribed for Class A in order to get fuel economy and keep maintenance costs at a reasonable figure.

Class A Cars

Generally speaking, Class A units have been gasoline driven, and the experience of many railways goes to show that this class of equipment is an economical and lasting development which will be improved to the point of high grade automobile reliability within a very short time. Already in many places these cars have retrieved business which had been lost to bus lines on the highways and also to the privately owned car, and it has been the usual thing to find that passenger traffic develops to a marked extent after a service has been instituted.

For Class A cars weighing approximately 30,000 lb. light, the general practice has been to use a high grade four-cylinder truck engine running at a maximum speed of approximately 1600 r.p.m. and developing a maximum of 70 hp. Wherever this type of engine has been used it has transmitted its power through clutches, transmissions, and universals to gears, most of which are of standard truck or even heavier design.

A general description of a typical powerplant such as mentioned above is as follows: Four-cylinder $4\frac{3}{4}$ by 6 in. engine; pressure oiling system; pump water cooling system; primary and secondary transmission; primary ratio, first speed, 4 to 1; second speed, 1 to 1. The secondary increases the speed from 26 m.p.h. for normal engine speed to 35 m.p.h. The first provides for ruling grade and the second for level track conditions.

To a much less extent the automobile type six-cylinder engine of the following general description has been experimented with: Six-cylinder $3\frac{3}{16}$ by 5 in. engine; pressure oiling system; gear ratio, 4.7 to 1 between engine and wheel; nominal engine speed at 30 m.p.h., 1450 r.p.m.; horsepower developed, 50 at 2200 r.p.m.; maximum speed, 2200 r.p.m.; pump water cooling system.

In general its power has been transferred through standard automobile clutches, transmissions, etc., which are used with the same type of engine in automobile service.

So far as the actual powerplant is concerned, it is the

opinion of many that the automobile engine has in almost every way demonstrated its superiority over the truck engine for Class A cars and for general service because of its ability to run over rated speed without serious loss of balance and consequent excessive vibration, and its economy under light load conditions. The first of these reasons undoubtedly embraces conditions which are vital to the successful maintenance of any machine or engine, and an attempt will be made to explain this from the everyday point of view arrived at through experience rather than from the dynamics of the problem.

Vibration Not Serious

Practically any high grade automobile engine designed for a rated engine speed of approximately 1450 r.p.m. at 30 m.p.h. with a gear ratio between 4 to 1 and 5 to 1 may be driven at engine speeds of 2200 r.p.m. and car speeds of from 50 to 60 m.p.h. without any noticeable vibration of a serious nature. Experience indicates that a similar flexibility cannot be expected from truck engines for any length of time without serious engine trouble developing and possibly resulting in a complete breakdown of the service.

When a motor coach is being operated on a railway where there are schedule connections to make and where there are meeting points designated by train orders and by the time card, it is certain that, regardless of the framing of a schedule, which should not develop an engine speed over that coinciding with the rated speed of 35 m.p.h., the operator will frequently exceed this by 15 or 20 m.p.h. in order to meet the requirements of the service after a delay of any kind. There is nothing parallel to this in highway work with either the automobile or the truck, but it is such an accepted fact on a railway that the only safe course is to provide the type of powerplant which will meet these requirements daily without breaking down; in other words, the powerplant must be moved out of the sphere of ordinary usage and into what might be called the outer edge of racing conditions. Railway gradients even accentuate this condition, as there is practically no opportunity for letting the engine cool off as there is on the highway.

The automobile engine has been designed not only for easy and economical low engine speed conditions, but also for those outlined in the preceding paragraph, and the experience of several Canadian railways with a number of cars operating under extremely different conditions seems to bear this out, which leads to the conclusion that the light weight, high speed gasoline engine is a satisfactory powerplant for the light weight cars described as Class A.

Class B Cars

The Storage-Battery Car—The general data of a typical unit are as follows:

Car—Interior arrangement, to suit purchaser; weight, 60,000 lb.; length, 53 ft.

Trucks—Two four-wheel standard M. C. B. axles, except that journals are fitted with roller or ball bearings.

Electric Motors, Etc.—Four 25-hp. motors (250-300 volt) mounted with a gear ratio of 16 to 91. Standard series and parallel controller and circuit breaker installed at each end and in baggage compartment; provided with voltmeter, ampere-hour meter, underload circuit breaker and switches for control of air compressor and lighting.

Storage Batteries—250 cells, capacity 450 amp.-hr. at 300 volts, or 135 kw.-hr. (580 amp.-hr. have been obtained with a minimum of 150 volts).

Battery Charging—Direct current at 250 or 500 volts may be used for charging, and the car is equipped with switches for arranging the battery cells in either series or

parallel. Normal rate of charging, 90 amp. Time required for a normal full charge, 5 to 7 hr. A higher rate of charging may be employed provided temperature of battery does not exceed 115 deg. Fahr.

Radius of Operation—Maximum 140 miles on a full charge, figuring on level or rolling grade. Recommended not to exceed 100 miles without obtaining a boosting charge.

Power Consumption—Power required, 35 watt-hr. per ton-mile. Acceleration, $\frac{1}{2}$ m.p.h. per sec. Maximum speed, 45 m.p.h. on level track. As the car weighs approximately 60,000 lb., 35 watt-hr. per ton-mile is equivalent to 1.05 kw.-hr. per car-mile for level track and normal conditions.

Within the above-mentioned radius of operation this car has been extremely satisfactory and is being operated successfully under low temperature conditions with no appreciable trouble. Its tractive effort of 2400 lb. makes it possible to use a trailer if necessary. The cost of operation, including all maintenance and transportation charges, power, etc., is 17 cents per car-mile. The maintenance has been extremely light, and all indications are that the life of the batteries will be eight to ten years at least.

Steam Cars—The steam powerplant was probably the first of any kind to be tried for self-propelled cars, but unfortunately its development has not kept pace with requirements. Medium pressure (300 to 400 lb.) boiler plants with comparatively low superheat (100 deg. Fahr.) were introduced to a considerable extent in continental practice several years ago, but the use of the steam car has not developed, due principally to the excessive weight and general complications of the equipment and the inefficiency of the boiler plant.

Brooks gives specifications of a steam car now being tested but says recent developments indicate that while the seriousness of the defects pointed out has been noted and improvements have been made, they have not yet been overcome to the point where steam power may be considered the most satisfactory unit car power.

The Heavy Duty Gas Car

The general specifications of a car of this type are as follows: Car length, 55 ft.; weight, loaded, 60,000 lb.; six-cylinder $6\frac{1}{2}$ by $6\frac{3}{4}$ in. engine, delivering 116 hp. at 800 r.p.m. and 225 hp. at 1600 r.p.m.; transmission with four forward and three reverse speeds geared to give 56 m.p.h. forward in high at 1400 r.p.m. and 37 m.p.h. in third speed.

This type of car has not been tested sufficiently to permit any accurate data to be given, but it is evident that the gasoline consumption will be at least twice that of a Class A car per car-mile. The problem of handling through the transmission and clutch the mechanical drive from a heavy duty gasoline engine of possibly 200 hp. has not yet been solved unless it may be through the medium of the oil transmission so successfully used in Navy work. However, the extreme complication of this transmission or magnetic control makes it doubtful at the present time whether gasoline powerplant will successfully exceed 70 hp. in capacity.

Double-End Control

The gas-electric system provides double-ended control and an efficient starting torque, but retains all of the complications of a dual powerplant. The general specifications of a modern gas-electric car are as follows: Car, length, 55 ft.; width, 10 ft.; seating capacity, 54, with 100 sq. ft. of baggage space; weight, loaded, 65,000 lb.; six-cylinder governor-controlled, 7 by 8 in. engine developing 150 b.hp. at 900 r.p.m. and driving a 100-kw. 700-volt generator which in turn drives two motors on the for-

ward truck; fuel consumption (estimated), 0.25 gal. per mile.

It is thought that there may be a possibility of employing a smaller capacity constant-speed gasoline engine (average running power consumption approximating 25 hp. for cars weighing 60,000 lb. loaded) which will drive a generator charging a limited battery capacity. Theoretically this might provide the starting torque desired and at the same time eliminate the undesirable features of the large powerplant, but it could not be an economic consideration where cheap power could be purchased.

Ball and roller bearings have been one of the most important factors in the development of the motor coach. Exhaustive tests indicate that the ball bearing has reduced starting friction under summer conditions to approximately 15 per cent of that of plain bearings, or in other words has reduced friction of approximately 20 lb. per ton to 3 lb. per ton. At the same time the average rolling friction at speeds up to 30 m.p.h. has been reduced by approximately 40 per cent, or from 3.6 lb. per ton to 2.2 lb. per ton.

Experience in this country indicates that the ball bearing is suitable for Class A cars, but that the areas and sizes for designed industrial work should be at least doubled for railway work due to excessive shocks and side thrusts. It is not possible at the present time to say whether side thrusts are more destructive than vertical rail shocks, but it is certain that for poor rail conditions the bearings should have a side-thrust capacity of 100 per cent of the vertical load.

For Class B equipment it may be necessary to use roller bearings for vertical loads in connection with special bearings for side-thrusts.

Type of Drive for Gas-Driven Cars

While the automobile engine is most suitable for the light motor coach, it must nevertheless be admitted that experience indicates that standard automobile transmissions, clutches, universal connections and driving gears are entirely inadequate for motor-coach service and are the cause of probably 75 per cent of the breakdowns. Similar parts which have been developed for truck engines are generally much superior due to their greater size and strength per horsepower transmitted.

The argument has been advanced that the parts are designed for the engine and will handle all the power developed by it; but this contention is not sound, because the greater inertia to be overcome at starting requires a momentary torque much in excess of anything experienced in automobile work.

Account must also be taken of the fact that in Canada and the northern part of the United States cars have to be operated in snowstorms, resulting in clutch slippage and shocks to transmission which are much in excess of those experienced in automobile service.

The method employed in transmitting the power to the wheels has generally been one of the following:

1. Through a standard transmission to one driving axle which supports the entire two-wheel rear truck and which can move in a vertical plane only. While this is the simplest method of driving, it hardly will ever be generally acceptable to the railways, as railway experience indicates that safety and good riding qualities are almost proportionate to the number of wheels in the trucks. This is particularly applicable to cars operating on cheaply maintained lines.

2. To both axles of the front four-wheel truck by gearing and universal connections from a transmission located behind the truck. Experience on some railways goes to show that this method is very successful, and although the number of universal connections is not reduced, the

shafts are all short and the driving forces are entirely removed from the passenger-carrying part of the cars, thereby reducing vibration.

3. To a transmission located at about the center of the car and from there to the nearest axle of each four-wheel truck or to both axles of two-wheel trucks. The advantage claimed for this method is that the entire weight of the car is available to give good adhesion (where the trucks are of the two-wheel type), but generally experience indicates that this is not necessary and is harder on the engine than an arrangement where part of the momentum of rotating parts may be taken up by slippage. Where four-wheel trucks are used this method has been found to give better adhesive qualities than connecting to both axles of one truck, but the advantage seemingly is not sufficient to warrant extra complication of transmission.

4. To the leading axle of rear four-wheel truck. The chief advantage of the drive to the rear truck is that the engine may be aligned in such a manner as to have its shaft center line pass through the center line of the main driving axle, thus reducing wear on the universals and friction to a minimum. The disadvantage is that it necessitates the use of one or more supplementary bearings between the engine and the point where the drive shaft is coupled to the front universal. The maximum lateral motion of a truck of 48-in. wheel centers and 18-in. truck centers on an 80-ft. radius curve is shown by road check to average $\frac{3}{4}$ in. at a radius from the center of 24 in., so that it is apparent that the swing of the truck has but little effect on the universals. The torque arms supporting the housings of such an arrangement should have both vertical and lateral swing. Only when the load on the main axle is not sufficient for adhesion it may be conceived that driving power acts on the second axle. Under ordinary conditions transmitting power to the second axle generates no more friction than that due to the weight of rotating parts.

Methods of transmitting power from the front axle to the rear axle of the rear truck may be subdivided as follows:

(a) Chain Drive—Chain drive has the disadvantage of rapid wear, noise, and the complication of shields and covers which more than overcome the advantage of the straight drive to the rear truck.

(b) Gear Drive—Gear drive to the second axle no doubt appears to be the best mechanical means of transmitting power, but it has all the disadvantages of rapid wear due to difficulty of adjustment of contact and the maintenance of extra universals.

(c) Side-Rod and Cranked Wheels—Side-Rod drive to the second axle, along with many other locomotive developments said to be crude and inefficient, in actual practice is a thoroughly reliable and easily adjusted and inspected arrangement, and is operating successfully at high and low speeds and with no appreciable friction.

(d) Miscellaneous, including oil transmissions that are still being experimented with.

A DETAILED survey of the tractor market in Kansas, Oklahoma and Nebraska, recently conducted in person by Harry Dodge, sales manager of the Gray Tractor Company, Inc., reveals some interesting indications as to future tractor requirements.

Briefly summarized, the principal improvements demanded in tractors, as developed through extensive inquiry among tractor users, are reported by Dodge to be as follows:

Better traction, eliminating slippage and power loss.
Improved ability to work on wet soil or in sand.
Increased suitability for working on plowed ground in order to enable better seed bed preparation.

Motor Transport Makes Great Strides in Europe

Use of cars, trucks, and buses increasing materially despite unfavorable economic conditions, says N. A. C. C. representative. Operating costs more important than in this country. Foreign business should be in hands of factory-trained American.

By Pyke Johnson
Secretary N. A. C. C. Highways Committee

AFTER returning from a trip to Europe, during which he attended the International Highway Congress and the meeting of the International Chamber of Commerce, Pyke Johnson prepared for the directors of the N. A. C. C. a comprehensive report of automotive conditions as he saw them. This article is a digest of that report. His observations will be of interest to the entire industry, since they comprise the opinions of a trained observer, thoroughly familiar with automotive problems.

MODERN transport is coming into its own in Europe. Handicapped by the weight of excessive taxation, depreciated currency and other burdens growing out of the World War, the inherent value of the machine as an agency in transportation has turned the scales in its favor and everywhere the use of the car is extending.

That that use will continue to expand is perhaps best attested to by the fact that all of the responsible highway officials of the countries of Europe are today planning their highway programs upon the practical thesis that highway transport of the future abroad will be the motor vehicle. The bullock, the donkey and the horse are still to be found upon the roads in many countries, but the determining factor is the car.

The one outstanding issue is the direction which motor transport itself will take. Today, because of the very high taxes which affect operating as well as initial costs to a degree unknown here, the trend is markedly toward a small horsepower motor. That trend is not finding favor with manufacturers who have foreign markets to consider, with users who prefer flexibility and power, or with road builders who fear that to the present demand for heavier roads may be added a need for grade reduction which will add further to road costs.

But the element of motor cost is primary, particularly in Spain, France and the other Latin countries, and for the present at least is very decidedly a factor in the selection of a car.

British Seek Tax Decrease

So serious has the situation become in one country, at least, that English economists are now turning their attention to the possibilities of securing as much or greater revenue through a decrease in the net tax per car, on the sound theory that by allowing a natural, mechanical development they will extend the operation of the vehicle.

Generally speaking, the American passenger car finds its greatest opportunity today in the United Kingdom, in the Scandinavian countries, Holland, Belgium and Spain. France and Italy are practically closed markets because

of prohibitive tariffs, and while a belief is expressed that Italy might again prove a market in four years, little encouragement is found regarding France, where the domestic motor industry is rapidly assuming a dominant place.

The commercial vehicle market is at a low ebb temporarily everywhere, due to the enormous surplus of war-time equipment which has found its way onto the highways of Europe. Not all of this material is yet absorbed and because of it neither foreign nor American trucks have been able to make much headway.

Expensive Education

But just as the distribution of war-time equipment here has proved an intensive if expensive means of educating the public to truck performance, so the same result is anticipated in Europe, where the effect is likely to be more pronounced than it was in a country accustomed as ours to the use of mechanical appliances.

In a third field, that of the motor bus, Europe is striding forward at an enviable clip. There are today more miles of motor bus routes in operation in Spain, Italy and Switzerland than there are miles of railroad in those countries.

Government officials have sensed the potential value of the bus as a means of tightening the bonds of political unity and in those places where motor bus operation cannot be made a paying proposition from a commercial standpoint France, Switzerland and Italy grant government subventions. So effective has this policy been found that, subject to reasonable safeguards, the French authorities now have under consideration statutes which will effectively broaden the application of the present act.

The bus is finding its way rapidly, too, in the capitals of Europe where narrow streets and a growing congestion have brought about a strong sentiment looking forward to at least a restriction in further tram line extension. An evidence of this attitude is found in the resolutions passed by the highway officials at their Seville meeting, when the Road Congress passed resolutions advocating removal of trams from busy streets.

In the coordination of motor with other forms of transportation, America has much to learn from Europe in both the goods and passenger branches.

As for highways, the writer found none in Continental Europe which compare with those in this country as a medium for the carriage of modern transport. The Appian Way and the French system so frequently spoken of in America as models of road construction are tributes to the engineering skill of past generations, but neither could be said to meet the needs of a developed transport such as we have.

Highway Research

In highway research, in economic surveys and in the design, construction and maintenance of roads, the American highway officials have carried this country forward to the most advanced standards. It is time that we accorded our own men the recognition due them.

Aside from the use of the small motor, which it should be noted is popular even in the most expensive cars, solely because of costs, the most notable difference between the American and European user of the car is the latter's fondness for a special body. American body lines do not generally find favor abroad, the Italians particularly being partial to individualistic designs. So marked is this preference that several instances were noted of cheaper American cars having elaborate custom bodies.

Four-wheel brakes are popular on the Continent, and it was strongly urged by some of our representatives that more attention be given by our companies to some accessory novelty as a selling point for people who have not always come to the point of buying a car on the basis of transportation service alone.

A general criticism was the suggestion that American manufacturers should always place their European business in the hands of a factory trained man of American birth, if possible, with nationals of the various countries as dealers.

Better Service Needed

Pleas for better service and for a closer study of European practice were also made by those having the interests of American manufacturers at heart. One case which was cited was that of a truck company which attempted to sell its goods in a Latin speaking country through the medium of circulars printed in English!

There are still some 500 trucks in France now available for reimportation. The French army is still using A. E. F. equipment, so that there is little possibility that it will be released. Statistics are not available as to the extent of this material.

Citroen is now working out plans for American models and expects to return to America in October, when he will definitely decide upon future policies. His installment plan of sales has been approved by Lloyds of London and is now effective.

Notes of passing interest are that the French officials would like to see the racing tangle straightened out and will welcome any action by Americans toward that end. French manufacturers would like to see the Chamber in the International body. The passenger car show is to be held in October without the Ford, but with the Lincoln, General Motors and Studebaker represented, and for the first time a separate motor truck show will be held but without any American machines listed.

The problems of the British motor industry are perhaps best summarized by Mr. Cole of the Humber, who is president of the manufacturers' association. The chief trials as he sees them are:

1. American competition.
2. Insistent labor demands.
3. High railroad rates.

While there was a temporary advance in British exports during the holidays, the British passenger car industry has generally been in bad shape, while the commercial vehicle trade is totally at a standstill. The Britons have not been able to meet foreign price competition and with few exceptions the manufacturers have been hard pressed.

As a general statement, the British are producing only for the domestic market. Fifty per cent of the home demand is being supplied by foreign cars and of that 65 per cent is going to American and Canadian cars. More of the American cars could be sold if prices were reduced.

The overhead difficulty confronting the British manufacturer appears to be the fact that some ninety companies are struggling for a business which could be better handled by fifteen. The result is that many are inadequately financed and lacking in equipment, even those who have equipment using handwork in preference.

While there seems to be no likelihood of consolidations in the immediate future, many failures are causing a more serious consideration of this need and only the pride of craft seems to stand in the way. Export combines are being discussed and the need for price reductions which can only be met by mass production is beginning to be felt.

Standardization Coming

There is a growing tendency toward standardization. The British manufacturer doesn't like it and doesn't want it, but the new models of Rover, Crosley and Morris-Cowley give evidence that the time of standardization is approaching, although it can scarcely be said that even these standard models are being produced for stock.

Labor troubles are always an irritant. This is particularly true in the body building field, few of the factories turning out their own. Consequently production is constantly interfered with.

While Ford is not considered a competitor in the passenger field, he is doing practically all of the business in the light commercial vehicle field. His one-ton truck is particularly popular, not only because of price but because it is largely made in England and will be entirely so in the near future when his operations get under way at Southampton.

The hold-over war stock is now fairly well depleted and will probably be out of the way in the near future, although the fact that there are some 4000 trucks at Bremen which are ineligible for reshipment to the States is cause for concern to British traders.

The recent refusal of the government to increase tariff duties on passenger cars or extend their operation to trucks forecloses any expansion of present duties before 1925 at the earliest, and close observers believe that reductions rather than extensions are likely then.

Lower Revenues Probable

The insistent demand for a gasoline tax has resulted in hearings of an extended nature, not yet closed. Authoritative opinion, however, is that no gas tax will be enacted, but instead that a 25 per cent decrease in the present passenger car tax will be granted at the next session of Parliament. All motor funds go to the highways and nowhere in England is there any feeling of concern over their road problems.

Traffic congestion is giving the English authorities a great deal of trouble and Parliament has named a commission to investigate this subject and make recommendations.

In general the American car is finding favor with the British, who dislike to change gears and who like flexible motors. The custom built body is preferred, however.

At the moment, the abnormal duties imposed in Italy on American cars are operating almost to prohibit their importation with the exception of a few of the cheaper makes. Fiat is the dominant factor in Italian production and in June was reported operating at about 75 per cent of capacity, the new small touring car proving particularly popular, as the Italian is today interested in a low priced, small motor car.

Special bodies are in favor and about 30 per cent of the Fiat output is chassis alone, the purchaser adding a custom built body. The fact that the automobile plants have been the center of a subversive labor movement has made production a difficult question and has occupied practically all of the time of the manufacturers.

Road Appropriations Low

At the present time the national government has no road appropriations and consequently the burden has fallen upon the larger cities. The result is that Italian roads are in generally bad shape and a heavy wooden and steel tire traffic has joined to make touring unpleasant, particularly in southern Italy.

Trucks are used chiefly in short hauls, particularly since the rail service has picked up, while special concessions are granted to buses in order to provide communication between towns and railroad stations, which are usually located some miles away.

The chief drawback to the use of cars in Spain is lack of service. In all Seville, for example, a city of 250,000 with a tributary population of 1,000,000, and 3000 cars, there is no place where skilled service could be found in June. Because of this, owners are forced to hire chauffeurs, which adds materially to operating costs.

Traffic regulations are few and far between. Apparently one can drive on either side of the street at any speed without trouble until there is an accident. Then a mob gathers, the car is burned and the driver, assuming he is not of the privileged class, is lucky to escape unharmed. Needless to say, the rule has usually operated successfully.

Spanish Commercial Treaty

The one condition which has given Americans concern in Spain has been the fact that Spain denounced all its commercial treaties in November, 1922. England, Italy, France and Switzerland immediately had theirs renewed, but no formal action was taken by this country until May, when our experts appeared in Madrid. The feeling of American officials interviewed here is that the treaty will be renewed, although perhaps not in time to allay some uneasiness. Should it not be, American exports would pass into the second column, which would mean a material increase in the duty on all manufactured products.

From interviews with highway officials in Spain, a brief picture of conditions in other countries was obtained.

In India the governmental reforms recently instituted have thrown control of highway building into the hands of native officials, with the result that there has already been a cessation of activity.

Japan is expected to pass new highway bond issues this year and South Africa is maintaining all of its roads if not building many, pending a better balancing of finances. Governmental upsets in China have brought industry to a standstill there, while recent overtures in the direction of treaties between Finland and Esthonia seem to offer some hope of a back door entrance to Russia.

The new Swedish government is decidedly favorable to roads and definite progress is anticipated there this year. Norway is setting up four experimental motor transport routes. Switzerland is paying more and more attention to the tourist traffic on highways, while Holland is facing

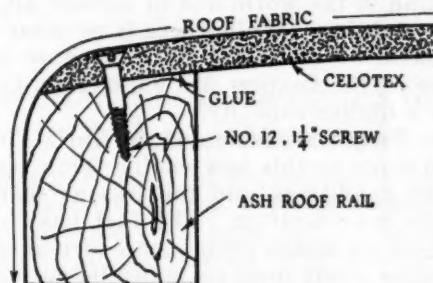
the problem of shifting part of its travel from canals back to roads.

Summed up, these specific incidents are illustrative of general conditions which indicate that everywhere the world is turning to motorized traffic as a new and growing means of transportation.

Celotex Used for Roof Panels

ABSORPTION of vibration, light weight, excellent heat insulation and simple application are the particular advantages claimed for Celotex, a material which has been on the market for some time but only recently used for molded roof panels. Celotex is made of cane fibres matted and interlaced so as to impart strength, but without the degree of compactness found in wood or wood fibre.

Experiments made at the University of Illinois show that Celotex is an excellent sound absorbing medium. In weight this material compares favorably with other roofing material. A $\frac{3}{8}$ -in. roof panel weighs 0.47 lb.



Celotex Roof Construction

per square foot, hence a roof panel of 40 ft. sq. weighs only 19 lb. This is said to be about 50 per cent lighter than most panel roofs and probably lighter than most soft roofs.

The specific gravity of Celotex is 0.24 while cork has a specific gravity of 0.22 to 0.26. The weight is 15 lb. per cubic foot. The average tensile strength of Celotex is given as 370 lb. per square inch as compared with a value of 340 lb. per square inch for white pine tested across the grain.

Standard heat transmission tests conducted at the Armour Institute of Technology are said to indicate that Celotex has a conductivity of 7.91 B.t.u. per square foot of surface, per deg. Fahr. temperature difference, per 24 hr. for 1-in. thickness.

Loading tests made on a Celotex roof and one of conventional slat construction showed that deflections produced in the two types were about equal for equal loads. It was observed that in the case of the slat roof the deflection was greater locally.

Methods of Attaching

There are various methods of attaching the roof panels to the roof rails. The method illustrated in Fig. 1 is recommended as experiments conducted on a vibrating machine show it to be the best. All methods employ gluing to the rail, but it is advisable not to glue-size any part of the roof panel other than the edges. If sizing is applied to the underside of the entire roof it will destroy the sound deadening feature. Consequently, this latter practice is not desirable.

Roof made of this material may be covered with a 13-oz. duck painted with asphalt paint. Oiled duck or similar roof fabric may be substituted. A paint and varnish finish applied directly has been found to be insufficient.

New French Fire Engine Has Sedan Body and Four-Wheel Brakes

Novel construction features shown in apparatus designed for special purpose. Capable of running 40 m.p.h. Four-cylinder engine, three-speed gearbox, and internal type rear axle used. Has pneumatic tires on steel disc wheels. Weighs 6 tons.

WITH the ability to throw 80,000 gal. of water per hour at a pressure of 85 lb. per square inch, the new fire engine which the Paris Fire Department put into service this week claims to be the most powerful of its kind in the world and to embody all the latest ideas in fire fighting. While there is no other engine on wheels capable of delivering this immense amount of water, some of the floating fire engines on the Hudson River have a higher capacity.

When the Technical Section of the Paris Fire Department began work on this new engine three years ago, it took modern conditions and the lessons learned from the war into consideration. The fact has to be faced that in case of an attack from enemy airplanes the high pressure mains would most certainly be put out of commission, and if reliance were placed on these alone, it would be impossible to combat fire. The new Paris engine, therefore, has been designed to be fed from the street mains or from the river, the canals or lakes within reach, and to deliver water under pressure to a distance of 1200 yd. from the source of supply.

The Paris chiefs are of the opinion that the practice of carrying firemen on the outside of the engine, as handed down from horse-drawn vehicles, is out of date. Consequently, the new engine has a sedan body for eight men and offers very complete protection for the three other men (driver included) carried on the front seat. In really urgent cases it is the practice of outlying re-

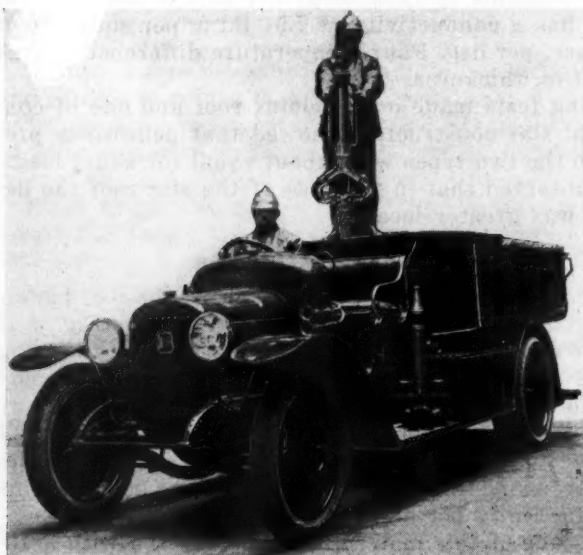
gions to call on the Paris Fire Department for assistance and runs of 40 to 50 miles are quite within the practical range. If such a trip is taken in midwinter, on an open engine, the men arrive in such poor physical condition that it is impossible for them to get to work immediately.

Long distance calls necessitate a high average speed and this engine has been designed to cover 40 miles within the hour. Pneumatic tires (955 x 155 mm., dual rears) on steel disc wheels are used. Four-wheel brakes were considered essential for an engine weighing 6 tons and capable of such a road speed. These brakes are of the external type, equal size front and rear; the pedal applies the pair on the front wheels and the one on the transmission, while the rear wheel set is hand-operated.

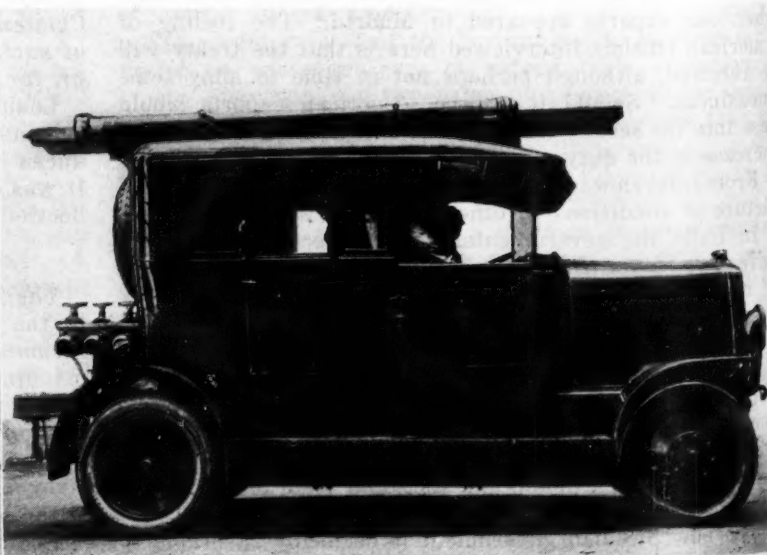
Motor Bus Engine Used

The building of the engine was entrusted to the S. O. M. U. A. firm, a concern closely connected with the Schneider organization. The chassis has a four-cylinder 135 by 170 mm. engine, mounted in front and driving through a three-speed gearbox and open propeller shaft to an internal gear type rear axle. The engine is of the same general type as those used on the Paris motor-buses, with inlet valves over the exhausts and a five-bearing crankshaft. Electric lighting and starting are fitted. At 1500 r.p.m. the power output is 115 hp., and at the normal speed of 1350 r.p.m., 85 hp.

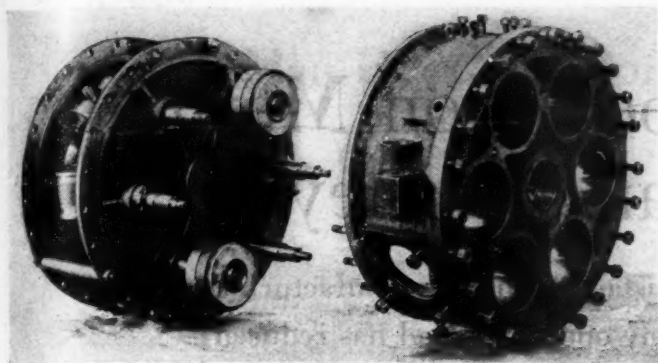
The pump is mounted at the rear of the chassis and is



Tender used with new Paris fire engine. Is designed to carry supply of hose and work with engine

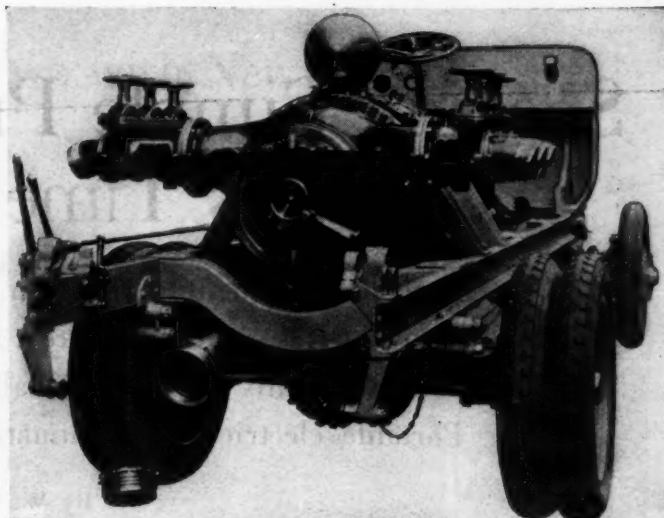


Going to a fire in a sedan. This Paris fire engine carries eleven men at 40 m.p.h. and can deliver more than 80,000 gal. of water an hour



Six-cylinder pump capable of delivering 80,000 gal. of water an hour

Chassis view of powerful Paris fire engine



driven by propeller shaft from the gearbox. All controls for the pump are at the extremity of the left-hand frame member, and comprise clutch, change speed mechanism and throttle. There are four gear combinations for the pump, corresponding, at a given engine speed, to pressures of 170, 142, 113 and 85 lb. p. sq. in. The pump is of the piston type with six cylinders disposed around a horizontal axis. The water inlet pipes are at the extreme rear and immediately below the frame members and the outlets are mounted three on each side. The rear of the pump is constructed like the breech of a cannon and can be opened instantly for quick changing of the valves.

High-Speed Tender

A high-speed tender on a pneumatic-tired Delahaye chassis is designed to carry the supply of hose and to work with the new engine. The two main feed pipes from the engine, having a diameter of 4.3 in., are connected up to the tender and the water is delivered through a 2-in. nozzle mounted permanently on top of the tender and having a universal joint allowing it to be turned in any direction and at any angle by one man. In addition to this main nozzle, the delivery can be made through three nozzles of 1.1-in. diameter, or twelve 7/10-in. or twenty-four of 1/2-in. Working without the tender, the engine can supply direct through six delivery pipes placed to left and right.

The capacity of the pump is such that drawing from the river or the canals, it can deliver to a distance of 1200 yd. from the source of supply. As an example, placed on the banks of the Seine it could fight a fire at the Opera House, two-thirds of a mile away, delivering 40,000 gal. of water an hour at a pressure of 57 lb. p. sq. in. through three 1-in. nozzles. The open supplies of water are such that a fire in any part of the city can be met in this way. Arrangements are being made, however, to establish fire hydrants of a sufficient capacity for the new engine, in different parts of the city, so that both sources of supply can be used.

Official Trials

During the official trials the engine was run for two periods of twelve hours at maximum power, all parts being sealed up to prevent work being done on them during the two tests. The total benzol consumption during the twenty-three hours the pump was under official observation was 160 gal. The road tests also gave complete satisfaction.

Before going into service this week the new engine was employed for a month in training the crew. Ar-

rangements have been made to purchase eight more of the same type, this number being considered sufficient to assure complete and adequate fire protection for the entire city of Paris.

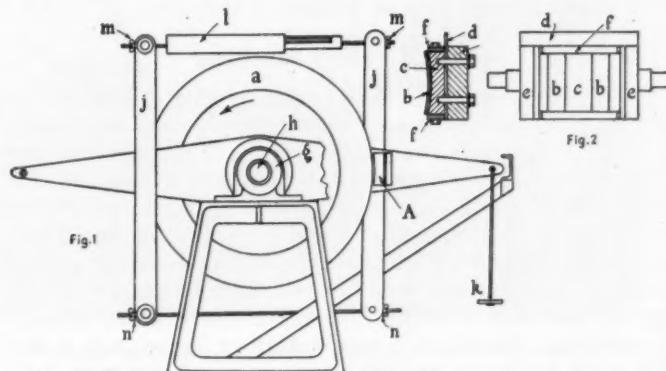
New Machine Is Designed to Test Friction Material

THE machine shown in the accompanying sketch has been designed for the purpose of testing friction material, principally asbestos fabric interwoven with brass wire. The machine was originally designed by a well-known maker of this commodity and somewhat modified after use in the National Physical Laboratory of England. It is quite a simple piece of apparatus and consists of flywheel *a* driven by a motor and arranged for water circulation in its trough-shaped rim, the temperature of which can be determined. The material to be tested is fitted to the component marked A, which is shown in further detail in Fig. 2.

The material is shown in position at *b* and is pressed against wheel *a* by holder *c*, back of which are a packing strip *d* and cast iron loading block *e*, end plates *f* being provided to prevent the test piece being carried around by the wheel. The whole machine is mounted in a cradle.

Operation Described

There is a bearing *g* for shaft *h*, the loading levers being shown at *j*, the scale pan at *k* and spring balance at *l*, adjusting nuts being provided at *m* and *n*. The direction of rotation of wheel *a* being shown, the action of the tester when in use is obvious, being as it is an adaptation of the friction brake principle.



Testing machine built by National Physical Laboratories, England

Seeking Simple Production Methods Saves Time and Money

Special department at Franklin constantly studies manufacturing system. Has simplified a great many operations and has reduced cost materially without installation of expensive equipment. Portable electric and pneumatic tools help to effect economy.

By W. L. Carver

IN equipping to meet an increasing production schedule, the H. H. Franklin Company has developed a number of labor-saving tools and devices which are noteworthy for their simplicity and capacity. Most of this equipment has resulted from the study and effort of the development department which this company maintains. The keynote of the work of this department has been the utilization of obvious methods with the simplest possible equipment. Consequently, a great share of the newer development has resulted in the application of portable tools of both electric and pneumatic types with simple mounting or holding fixtures.

Adoption of the new equipment has in every case resulted in several manufacturing advantages, the first of which is lowered costs as the increase in production is obtained with the same or a smaller number of men per operation. Secondly, more uniform quality results from regulated pressures of a mechanical unit in the hands of a semi-skilled operator than can be obtained by physical efforts of more skilled types of labor when the production of approximately sixty units per day is considered. In the third place, a lower labor charge for an equal unit of time follows naturally upon the second consideration. Fourthly, as the new developments result in less fatigue loss and assist in producing consistently good wages, labor turnover is at a minimum.

A casual inspection of the plant quickly reveals that these devices are not temporary expedients, but represent well-planned utilization of the obvious methods of performing an operation. As a great proportion are built around standard portable tools, the initial expense for development and equipment is low. Specialized functions are obtained without the customary investment in highly specialized machinery which may become obsolete by a slight change in the design of the car.

Axle Riveting Machine

Excellent samples of the results of this policy are to be found in the front and rear axle riveting machines. As both front and rear axles of the Franklin car are built around tubular structural members, a considerable amount of riveting is required for the attachment of the spring pads and steering knuckle yokes on the front axle tube. Assembly of the differential housing, spring pads and bearing carriers to the tubular members forming the rear axle housing involves a still greater amount of riveting. Based on a production of sixty cars a day this work formerly required five gangs of two men each in practically a separate department. With the adoption of the new equipment this force has been cut to two men, each occupying a place in the assembly line.

The new equipment, as illustrated by Figs. 1 and 2, consists of a heavy cast iron table which is supported at bench height by a pair of cast bench legs. Upon the table are mounted supports carrying a horizontal rail which in turn forms the support for a movable carriage. This carriage is fitted with a lever-operated vertical slide which carries a standard pneumatic riveting hammer, the throttle being actuated by a trigger on the slide actuating lever. The rear axle assembly is supported in saddles on a relatively long table, while the front axle is supported in a saddle at the knuckle end and retained at the center by a rotating clamp which is placed at one end of a shorter table. The center of the axle is offset from the center of the rotating clamp to compensate for the drop at the middle portion of the axle. With this arrangement it is necessary to turn the axle end for end to complete the riveting operations at both ends.

Sequence of Operations

In production the operator first groups the assembly and then inserts several rivets; next an expanding mandrel which supplants the usual dolly-bar is inserted and locked in place; the riveting then follows as the operator depresses the trigger and preses down on the actuating lever. This one-man operation may be compared with the former routine, as illustrated by Fig. 3.

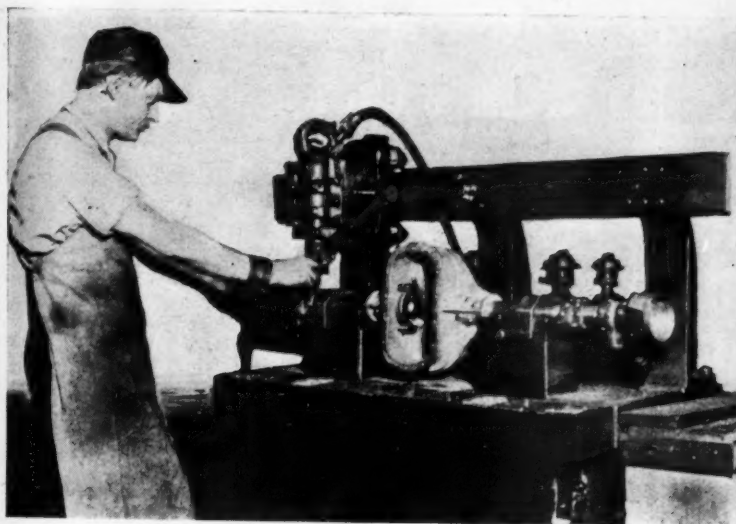
Cold rivets are now used in place of the former hot-headed type. The average quality of the cold riveted joint produced by the present equipment has been found to be superior to that of hot riveting by the previous method. When it is considered that the price of eight men's labor is deducted from the cost of a day's production at just these two operations, the time required to absorb the cost of the new equipment is almost negligible.

Another economy of a similar nature has been effected by the use of a simple fixture to retain the steering gear housing during the riveting operation, as illustrated in Fig. 4. In this case, first the steering column tube and then the rivets, with a mandrel which seats the inner heads, are inserted into the housing. This assembly is then placed in the fixture shown in the foreground of Fig. 5 and held by the pressure of the operator's foot. One man now handles the production of sixty per day whereas two, as illustrated by Fig. 5, were formerly required.

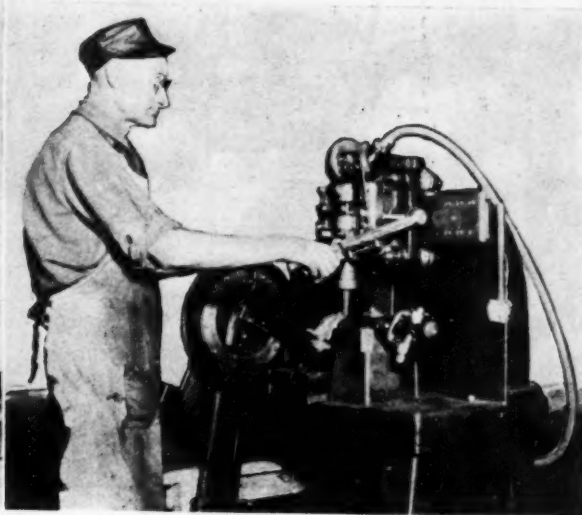
An entirely different class of work, but the same policy, is involved in the bearing facing operation illustrated by Fig. 6. The die-cast bearing shells are seated in the crankcase with about 0.010 in. projection above the shim surfaces, which is now milled flush to insure a perfect seat for the bearing cap. A standard electric drill is

One Man Does Work of Two with New Appliances

3. One of the crews formerly engaged in riveting axles. The two photographs just below illustrate the new way in which this operation is performed. The old method, shown in the picture on the right, required two workers, while the new one needs but one



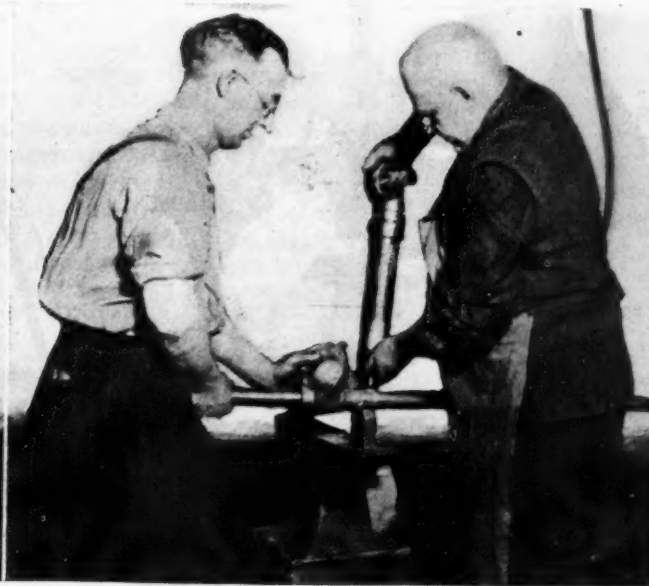
1. Rear axle riveting machine showing pneumatic riveting hammer mounted on a sliding head



2. Front axle riveting machine of the same general character

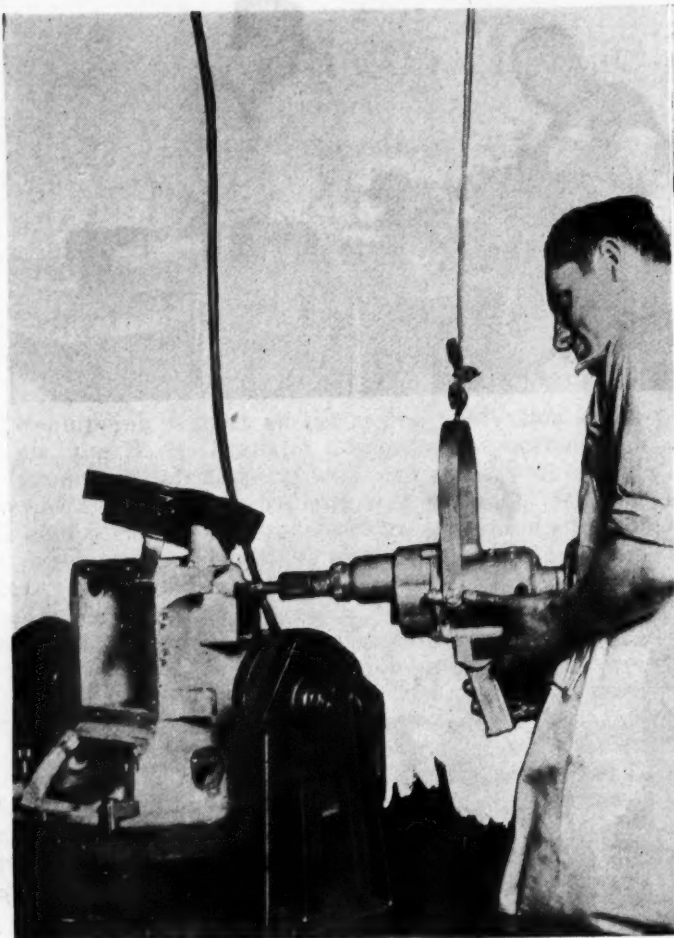


4. Present steering gear riveting operation requiring one man



5. Former method of riveting steering gear requiring two men

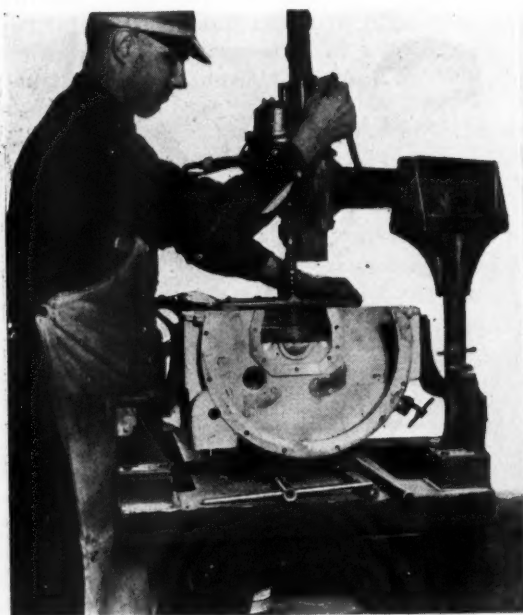
Efficient Fixtures Cut Production Costs



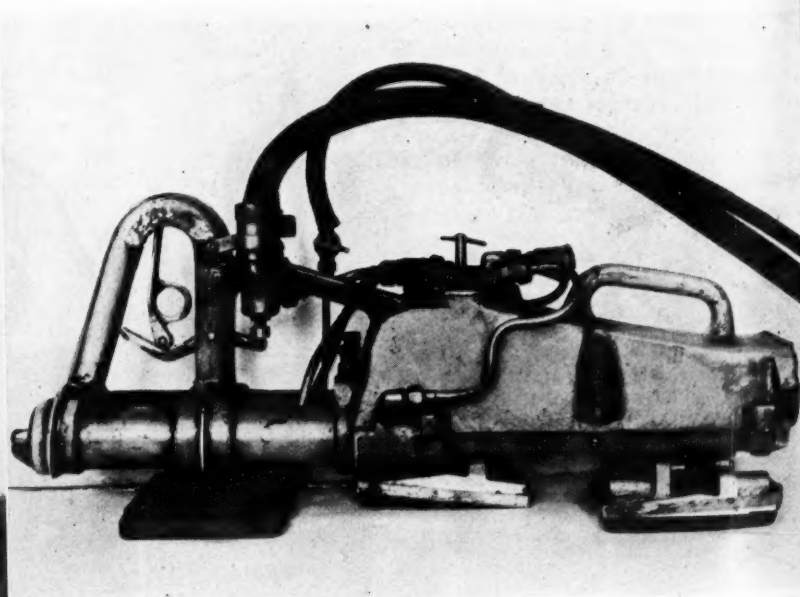
7. Portable electric stud setter in use on the transmission assembly line



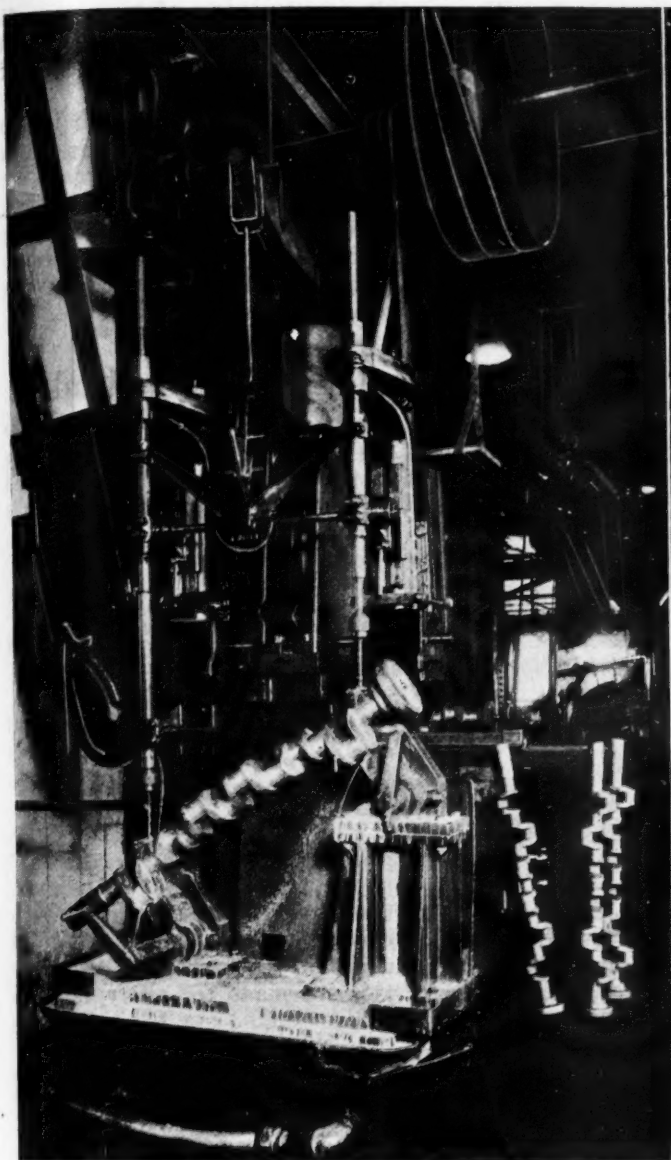
8. Former stud setting equipment which was replaced by that of Fig. 7



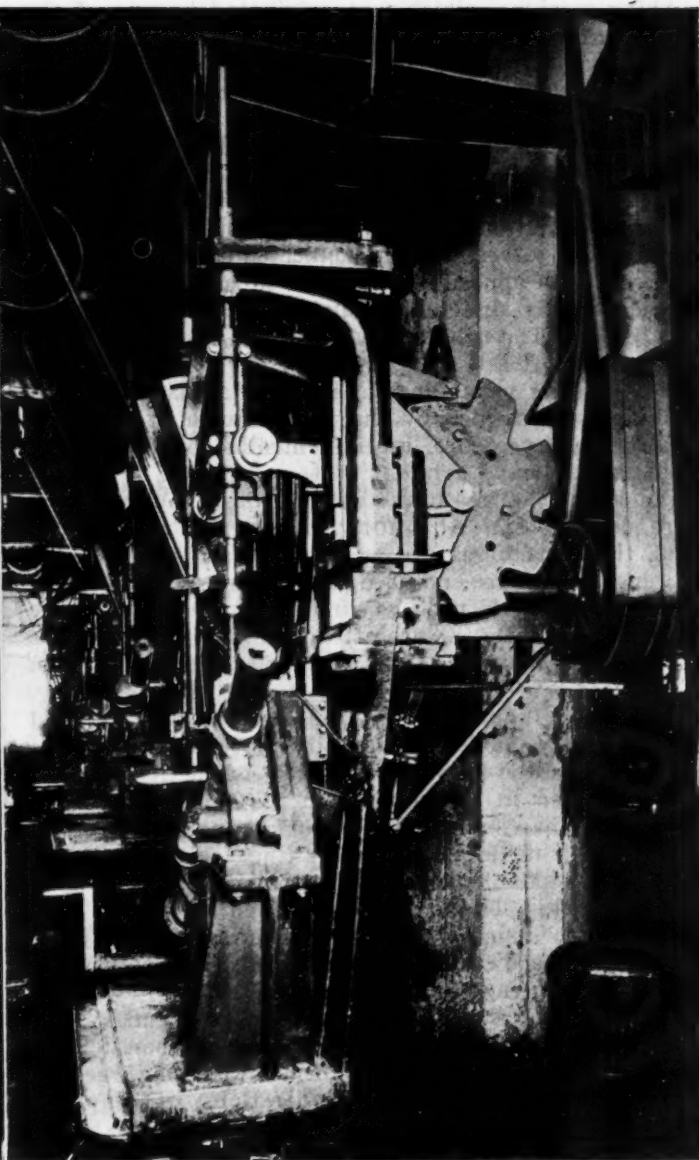
6. Crankshaft bearing surfacing operation



9. Pneumatic rubbing machine which is operated by unskilled labor



10. Front view of the crankshaft oil hole drilling machine



11. Side view of the same machine, illustrating the drill feed cam

mounted on a vertical lever-operated slide which is carried on a telescopic arm in a hinged head mounted at the back of the bench. A quick action collet connects the drill with the milling fixture, which is centered at each bearing successively by dowels that project into the holes already drilled in the lower flange of the crankcase. The extreme downward position of the cutter, and therefore the depth of cut, is determined by a collar on the cutter arbor. This position is adjusted so that the finished surface of the babbitt is exactly flush with the surface of the aluminum crankcase.

Formerly this operation was performed by hand with a specially formed file, and an expert was required to insure flush surfaces at completion. The arrangement illustrated reduced the time of the operation from 13 min. to 4 min., resulting in a more uniform job and the elimination of two men from the engine assembly line.

A similar arrangement of pedestal and arm is used with an electric stud and nut setter. This machine is used for setting the studs in the upper and lower faces of the crankcase. The motor is fitted with a reduction gear, below which is an emergency friction clutch and finally a jaw clutch. The friction clutch is designed as a safety device to relieve the mechanism of the motor of

the impact at the point of seating. The two members of the jaw clutch are normally spaced somewhat apart until downward pressure on the motor housing causes engagement. The driving faces of the jaw clutches are cut at a reverse angle to prevent accidental disengagement while the stud is being driven down. While setting a group of studs the motor rotates constantly, but the stud driver rotates only as pressure is applied to the hand lever and causes engagement of the jaw clutch.

Increased Flexibility

Greater facility as a result of increased flexibility has been obtained by the substitution of the electric stud driving equipment shown in Fig. 7 for the pneumatic driver shown in Fig. 8. The former equipment was rather heavy and capable of work in the top plane only. The newer equipment, which is similar in internal design to that described in the previous paragraph, is carried in a counter balanced stirup, is much lighter and easier to handle and, finally, is capable of operation in practically any plane. These features eliminate a great amount of manipulation of the gearbox between operations and consequently decrease time allotment and fatigue.

A novel development is to be found in the pneumatic rubbing machine, which was originated by one of the members of the development department. This machine, illustrated by Fig. 9, consists of two cylinders which are located under the hand grip and attached to an aluminum housing at their outer ends. Within the housing are two slides that guide the piston actuated rubbing heads. The valve mechanism, located at the top of the housing, is equipped with a variable cutoff that permits selective variation of the length of the rubbing head stroke. The valves are interconnected so that the heads reciprocate in opposite phases. A third head or pad is placed directly under the hand grip and serves as a steady rest. The rubbing heads, which are swiveled, are fitted with soft felt pads for varnish rubbing and with canvas belting pads for rough stuff. A water line for flushing is controlled by the valve shown at the rear, while the air pressure line is controlled by the trigger inside of the hand grip.

Due to the changes in the body finishing routine which were described in *AUTOMOTIVE INDUSTRIES* of May 31, 1923, these machines are at present used only for the rubbing operations on the hood. Formerly, 40 min. of a trained rubber's time was required for rubbing one hood by hand. By the use of this rubbing machine this time is reduced to 20 min. and ordinary labor has been substituted.

A different application of the same policy is found in the equipment for the drilling of the diagonal oil holes in the seven-bearing crankshaft. Practically every plant engaged in the production of diagonally drilled crankshafts has had at one time or another more or less trouble with drill breakage resulting from the human equation attendant upon hand operation and feeding of the drill press. The holes to be drilled are rather deep and small in diameter, and unless the operator's judgment is good the chips jam and break drills, necessitating a nasty salvage operation.

Franklin has eliminated this trouble by making the feed and periodic withdrawal of the drill automatic. At present one man performs the former work of three and has time available for clean-up operations. The quality of the work is more uniform and drill breakage is at an irreducible minimum. A notched cam has replaced the usual hand lever in controlling the travel of the drills. As illustrated by Figs. 10 and 11, the periphery of the cam is in the form of a spiral which, through the medium of a pivoted roller arm and a cross bar between the spindle heads, advances the drills at a constant rate. A heavy counterpoise, which is also connected to the cross bar, raises the drills as the depressions in the cam index with the roller. As the drills are fed half way from each end of the hole the effect of these nine depressions is sufficient for thorough chip removal. An automatic trip lever stops the cam feeding device with the drills in the uppermost position after the maximum depth has been drilled.

Consist Mainly of Commercial Units

These machines are operated in two batteries of three each. The first machine has the spindles close together for the drilling of the middle pair of holes. The spindles of the second machine are spaced farther apart and those of the third are still farther out for the drilling of the intermediate and outer pairs of holes respectively. The shafts are retained in position by quick action, hand operated cranks and are turned end to end for the completion of the half holes at each machine.

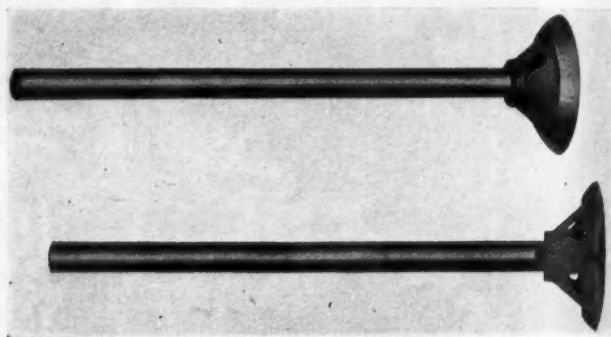
Standard commercial units form the great part of these machines and the cam feeding device is made of comparatively simple, inexpensive parts. As a result of

this installation production rate and quality have been improved, with a simultaneous saving of more than 65 per cent in labor charge. The human element has been reduced, as loading and renewal of drills are the chief requirements of the operator.

The installations which have been described in the previous paragraphs are typical of many others which are in operation at the Franklin plant. They are not regarded as being temporary in nature, but have been adopted as the obvious, economical means of bringing about an increase in production with no letdown in quality, with the idea of decreasing the number of men engaged in a specific operation wherever possible.

Poppet Valve Has Hollow Head

A HOLLOW head poppet valve has been placed on the market by the Gas Engine Valve Co. The hollow head of the valve is of cast iron and the stem of steel, and the two are welded together at top and bottom. It is



claimed for this valve that it will not warp, pit or burn. Besides, the cone-shaped bottom of the valve head is said to have a favorable influence on the gas flow. We are informed that the valve is to be made for all types of internal combustion engines.

Permanent Testing Staff Recommended

A DEPARTMENTAL committee on agricultural machinery of the British Department of Agriculture has recently made a report in which it recommends the establishment of a small permanent testing staff attached to the department, of an advisory committee to advise on testing and research work, and a program of tests with the issue of certificates stating the actual performance of the machine. The advisory committee is to be representative of interested associations and institutions, including the Ministry of Agriculture and the Department of Scientific and Industrial Research. The other bodies mentioned represent the farmers, manufacturers of agricultural machinery, labor and consulting engineers.

The scheme of work proposed covers what the report terms series investigations as well as individual tests. The former are intended to be trials of short duration of a number of machines performing the same operation, reports on the results to be published for general information. The individual tests are suggested to enable farmers and others to obtain an idea of the performance of a machine. A certificate would be granted stating that the machine had done a specified amount of work at a certain cost, and recording its state at the end of the trial, merits as regards accessibility, replaceability of parts, wear and so on. Further, research work on the exact requirements to be met in the design of machines, and the promotion of discussion and exchange of views between all interested, as well as the encouragement of improved or new appliances, are to form part of the scheme.

Buses Need Better Brakes and Universal Joints, Street Railway Executive Thinks

Changes in design needed to make vehicles entirely suitable for use as adjuncts to electric lines. Lower chassis and improved chains among changes suggested. Axle breakage high.

By E. B. Atchley

Northern Ohio Traction and Light Co.

ELECTRIC railway companies already have bought many buses to use as auxiliaries; they will purchase more when designs are developed to fit special requirements. In this article, one electric railway executive gives his views on bus construction.

THE extension of the field of the motor bus as an auxiliary to many of the street railway systems throughout the country has given rise to the question: "What can be done to make bus designs more adaptable to street railway uses and increase the life of operation?" This question has caused loss of sleep on the part of superintendents of rolling stock and equipment.

Many street railway companies are charging off a depreciation of 25 per cent annually on their bus equipment. From experience, it seems that this figure is insufficient. The average type of bus, when put to hard usage as an adjunct to a street railway system where schedules must be kept and where service must be maintained from 18 to 24 hours daily, does not appear to be standing the strain. Buses on some lines, notably on those throughout Northern Ohio, which have been in use less than two years give evidence of not being able to stand up for another two years.

Design Changes Suggested

Just what can be done remains to be seen, but a number of changes can be made that will make for better service. Here are some which should be considered:

- 1—Frame of chassis should be lowered to eliminate step accidents and lessen the time of loading and unloading.
- 2—Changes in the braking system. At the present time the drums and shoes are not sufficient for the frequent application of brakes necessary in daily operation.
- 3—Lessen the vibration. Trouble develops in lighting system, radiators, fenders and the body itself from the intense vibration.
- 4—Change design of universal joints and rear axle to prevent breakage. There is heavy expense from breakage of universal joints alone, while the breakage of axles after the first year of service also runs high.
- 5—Heating system. Under present system buses are not properly heated in cold climates. The possibility of gases escaping into the bus should also be eliminated.
- 6—Better designs of chains to prevent skidding and to prevent the great damage to tires.

Improvements along the lines suggested will result in a bus far more adaptable to the use of street railway

systems. The Northern Ohio Traction & Light Company has made a close study of buses. The company has been operating these motor vehicles as adjuncts to its city system in Akron, Ohio, for the last eighteen months. The company is finding the depreciation heavy, but the buses have been given hard service, as the city is very hilly.

Company officials suggest that the chassis should be lowered. Some damage claims have resulted from the high steps, and yet the buses in use have lower steps than the average bus. The bodies were designed with that in view. It is suggested that the frame be dropped lower over the rear axle and that the springs be attached below the axle as well.

The four-wheel brake is suggested as an elimination of the difficulties which have been experienced with rear wheel brakes.

There can be no question but that engine balance should be improved, and it may be necessary to adopt a six-cylinder engine. Vibration resulting from high-speed four-cylinder engines is causing untold troubles in the service.

The experience of this company has been the experience of many others in connection with universal joints. The expense resulting from broken joints has been very great.

Rear axle breakage is entirely too high. A heavier axle is needed, and it may be necessary to design a hollow axle to meet the needs of heavy city service.

Considerable difficulty has been experienced in keeping the buses warm in extreme cold weather. Some arrangement might be perfected that would bring more heat from the engine into the car and at the same time keep the objectionable gases away from the passengers. This is a matter of interest only to companies operating buses in the North.

Chain Troubles

In hilly cities, and in cities having a great deal of snow and ice during the winter months, much trouble has developed from the type of chains now in use. Chains simply "chew up" tires. In Akron last winter the tire cost due to the use of chains was very high. This company uses a dual wheel on the rear. It would also be of advantage if a chain could be designed which could be put on and taken off more easily. At times it was necessary to keep a truck out day and night to take care of chain and tire trouble during the spring months.

Power Plant of New Rail Car Located at Rear End

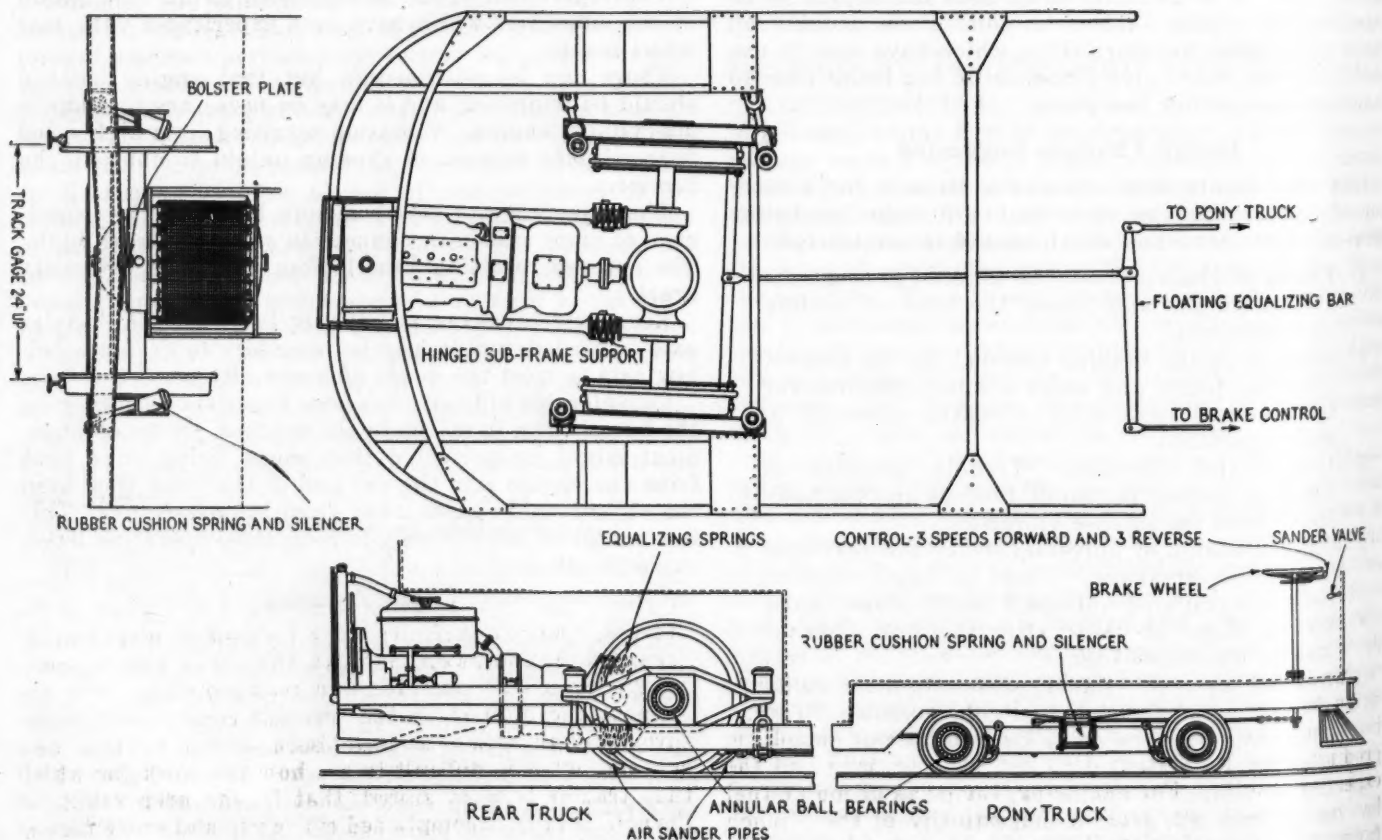
Narrow gage design is to run at altitudes varying from 4500 to 5500 ft. Length of vehicle is 32 ft. and width is 7 ft. One man operates it. Four-cylinder engine, $4\frac{1}{2}$ in. bore and 6 in. stroke, is used. Rubber cushion springs help to reduce noise.

A NEW narrow gage rail car, built by A. Meister Sons Co. for the Nevada, California & Oregon Railway, operates on tracks the gage of which is only 36 in. and has its power plant in the rear. The cars are to run at altitudes varying between 4500 and 5500 ft. The length of the car is 32 ft., the width 7 ft., and the distance between the rear drivers and the center of the bolster bar on the front truck 20 ft. The height from the top of the rail to the center of the roof is 8 ft. and the height from the top of the rail to the floor of the car 14 in.

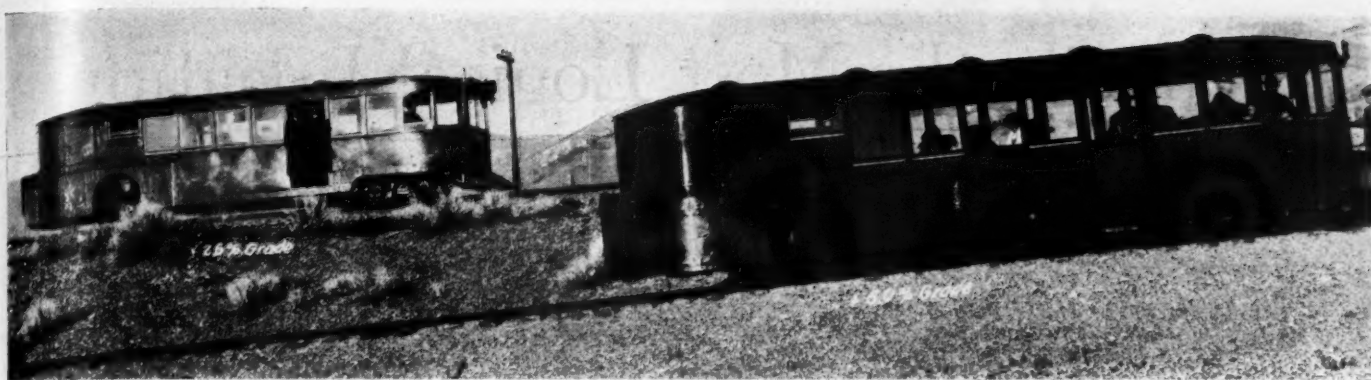
These cars are operated by one man from the front end. The power plant consists of a four-cylinder gasoline engine of $4\frac{1}{2}$ -in. bore by 6-in. stroke. Combined with the engine is the change gear. An innovation is the placing of the entire power plant behind the rear axle, for which arrangement a number of advantages are claimed. It permits of dropping the frame below the rear axle, thus insuring a low center of gravity, which is essential to

safety in narrow-gage coaches. The two rear wheels being the driving wheels, the location of the power plant behind them increases the weight on the drivers and, therefore, the adhesion. There are no revolving parts ahead of the rear axle, and it is claimed that passengers are not annoyed by noise, smoke or smell from the engine. Rubber cushion springs are used, which further tend to reduce noise.

The power unit is supported on a subframe, the side members of which are hinged at their forward ends to the rear axle case. Spring horns are provided on the forward ends of the subframe members and the rear axle center housing, between which are placed coiled springs that take up the torque reaction. At the rear end the subframe is supported from the main frame by a swivel bolster bar. Hence the power plant is spring-suspended. The rear axle, subframe and power plant swivel around a vertical axis when the car makes a curve, whereby



Details of rail car construction



Rail motor cars on Nevada-California-Oregon Railway.

side thrust is relieved and the wear on wheel flanges reduced. The main frame is suspended from the wheel trucks through rubber cushion springs whose axes make angles of 15 deg. with the vertical, so the frame has a self-centering tendency.

It is claimed that the riding comfort of the rear seats is equal to that of the center seats. The car when empty has a weight of 16,000 lb. Among the equipment may be mentioned the electric generator, electric starter, electric lights and electric horn, an Arcola hot-water heating system, and a Westinghouse air accumulator which takes

air (or gas) from the front cylinder of the engine. This air is being used for the "sandlers" only.

A trial trip of these cars over a distance of 520 miles was made recently and the manufacturers inform us that the fuel consumption was a gallon of gasoline for every 11 miles, one quart of water and one pint of lubricating oil for the whole trip. A maximum speed of 55 m. p. h. was reached, and on one stretch, between Alturas and Wendel, a distance of a little over 100 miles, an average speed of 35 m. p. h. was made with 28 passengers, this stretch including some 2½ per cent grades.

Motorizing the Farm in France

AT the end of the war French agriculture was in a very serious condition and there was acute dissatisfaction among the farming population. During the war period many of the fields had been allowed to overgrow with weeds and much hard work was required to bring them back to their pre-war state of fertility, but labor was scarce and unprecedentedly expensive. To appease the farmers a scheme for motorizing the farms with the help of Government subsidies was conceived and put into operation. A bonus was paid on all tractors purchased by the farmers, even on tractors of foreign manufacture, though in that case the amount paid was considerably lower. All tractors were to be operated on fuel of native production. Alcohol was the fuel of which large quantities were immediately available. As a concession to viniculturists the use of alcohol produced from grains, potatoes and beets for beverage purposes was prohibited, so the whole production was available for industrial and power purposes, and the Government secured a monopoly of the distribution. A committee was appointed to study the best conditions of use of this fuel in existing engines, and much experimental work in connection with the problem was done in various scientific laboratories.

However, in spite of the enthusiasm engendered by the promise of a national motor fuel, which should render France independent of foreign countries in respect to this commodity, and help her to maintain the exchange value of the franc by making it unnecessary to spend large sums abroad annually in the purchase of petroleum products, the legislation does not seem to have had the expected results. For one thing, the price of motor fuel has not come down, and as the majority of the French farms are of small size, it was found impossible to use tractors economically on any large number of them. Another scheme for helping the French farmer was then

evolved and is now receiving the support of the Government.

France is not very rich in coal deposits and always has been compelled to import a large part of her requirements in that line. On the other hand, a considerable proportion of the country is mountainous and there are many large waterfalls. A national propaganda for the development of these water powers, which are picturesquely referred to as "white coal," has been started. Of course, the power of the hydro-electric plants to be built is intended primarily for the industries, but it is now proposed that the power requirements of the farms shall also be met from these sources. For such farm operations as threshing, water pumping and feed grinding the electric motor lends itself very well, but the chief power requirements on the farm are in connection with field operations.

It is not impossible to solve the problem of plowing and cultivating by means of electric power, but the most feasible scheme evidently would be by means of a draft cable stretched across the field, and as, in addition, electric cables extending to all parts of the field would be required, it is obvious that the scheme involves a great deal of initial outlay. This part of the general scheme of power farming seems to be passed over lightly at the present, while attention is being focused on what may be regarded the chores on the farm, the use of motive power for such work as pumping and feed grinding. For the moment the interest in the internal combustion engine farm tractor seems to have been dulled by this new scheme, but it is difficult to see how the work for which that tractor is most suited, that is, the preparation of the soil, is to be accomplished efficiently and economically by electric power, and unless this problem is solved, the petroleum type of tractor will have another chance in France before long.

What Is the Most Logical Location for Non-Metallic Gears

Westinghouse engineer thinks it should be on camshaft, since this position permits use of metal hub. Noise is reduced to a minimum, because bearing surface of quieting member is much greater. Believes dismounting is accomplished more readily.

By T. C. Roantree

Gear Application Engineer

Westinghouse Electric & Manufacturing Co.

DURING the progress of automobile construction it was found that of all motor noises, the most persistent and difficult of elimination are those caused by the trains of metal timing gears. Manufacturers who minimized their timing gear noises kept the car owners satisfied and found a subsequent increase in sales.

Realizing the vast importance of this condition, the Westinghouse company, some eight or ten years ago, developed a type of non-metallic gear material designed to operate with metallic gears and to perform the requisite work of the timing gear quietly, efficiently and permanently. This material is known to the commercial world as micarta and was practically the first in the field in this line of endeavor.

The first form of gear blank naturally was one composed entirely of the special material. This type was succeeded by a gear composed of a ring of non-metallic material which was riveted to a metal hub. Both of these types proved rather expensive, the former because of the quantity of non-metallic material required and the latter because of the cost of assembling it.

Many arguments have been advanced on the question of the proper gear to which to apply the non-metallic material, and the main reason for developing the feature of molding to a metallic hub was the conviction that the camshaft was the logical location for the micarta gear.

The larger size of the camshaft gear permits the use of a metal hub, thus furnishing an accurately drilled and reamed bore for the desired perfect fit, and it will also permit the use of a hard-driven key if the assembly is so designed. There need then be no fear of mutilating or possibly permanently injuring the material, should the hammer blow be deflected.

With the metal hubs, if "puller holes" are drilled or tapped in them, there is no possibility of the threads stripping, as frequently occurs when endeavoring to remove a gear having the puller holes in some non-metallic material. Removing the gear without using the puller holes often results in not only ruining the teeth of the gear but in harming the mating teeth and frequently in scoring the shaft.

The tendency to be expanded by heat being common to practically all materials, it is best to have the camshaft gear of micarta, as the expansion is directly proportional to the radial thickness, and the thickness of the non-metallic material is much less in the camshaft gear of the molded-on-the-hub type than in either of the two smaller gears. The use of micarta, therefore, not only gives a quiet-running timing gear but furnishes greater assurance of its permanence.

The quieting element being micarta, the greater the bearing surface of the non-metallic material the greater the degree of quietness. The aggregate of the bearing surface on the cam gear in a three-gear train is at least equal to the sum of the surfaces of the crank and generator gears, and usually in excess of that sum.

The service period of anything is inversely proportional to the frequency of its use. In the average three-gear train, one of the smaller gears revolves three times as fast as the cam gear, and the other smaller gear revolves twice as fast as the cam gear. Therefore, the cam gear

should be of micarta for reasons of durability.

There are several reasons why the crank or generator gears in a three-gear train should *not* be of non-metallic material.

The crank or generator gear, because of its small diameter, is not as likely to possess teeth with a perfect involute profile, and is thus more susceptible to wear, hence it should be of the harder material.

The vibration of the motor directly affects the quietness of the gear train. There is "whip" in the crankshaft and considerable of the torsional vibration is lost during its transmission to the camshaft through the gear mesh. The resilience of micarta assists in decreasing the vibration, and the non-metallic material on the camshaft will more nearly effect its complete elimination.

The unequal diametral expansion of the non-metallic material, because of difference of diameter, when used on crank and generator or pump gears, destroys the similarity of backlash between these gears and the camshaft gear, resulting in unequal wear and thus removing two of the requisites of a quiet train.

Crank and generator gears are more difficult to install,



Fig. 1—Typical molded-on-the-hub timing gear

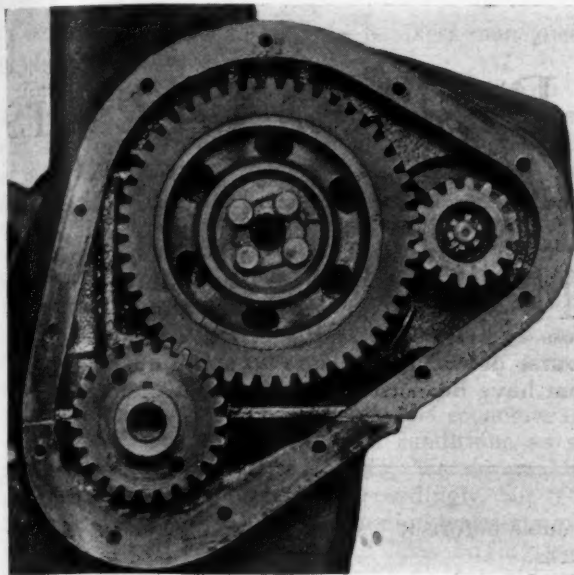


Fig. 2—Typical arrangement of molded-on-the-hub type cam gear in a three-gear timing train

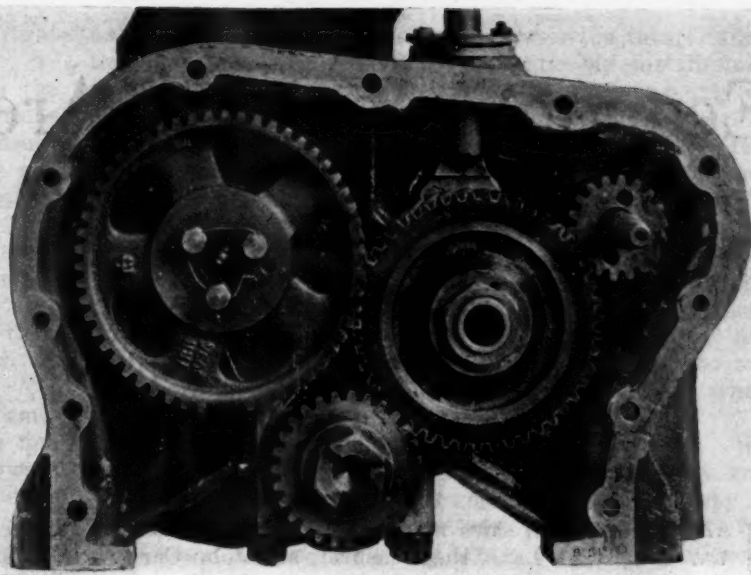


Fig. 3—Typical arrangement of molded-on-the-hub type idler gear in a four-gear timing train

for in many cases it is necessary to first release the motor from the frame, with all the usual complications. In addition, the actual removal of the gears from the shafts is more difficult, due to the adoption of a "shrink" or "press" fit in their assembly. This method of assembly makes the non-metallic material less applicable to the smaller gears and accentuates the advantage of its use on the camshaft, in that it leaves the practical standard of gear assembly on the other shaft unchanged.

The ease of dismounting of the camshaft gear, because of its frequent assembly with cap screws, is further enhanced by its ready accessibility, for plenty of room is available after removing the gearcase cover. These features reduce by from one to four hours the time required

for replacing a camshaft gear, as compared with that required for replacing the crank and generator gears.

The metal hub construction of the non-metallic gear is preferred because of its adaptability to closer machining limits in the bore, lesser susceptibility to injury, lesser expansion of the non-metallic material because of less radial depth, greater degree of security to shaft and the assurance of concentricity.

The camshaft is preferred to the crankshaft for the location of the non-metallic gear because of the greater bearing surface of the quieting element, resulting in more quiet operation, the greater durability because of fewer total contacts, greater uniformity of expansion and greater ease of removal.

New Books Discuss Fuel, Metal Alloys and Aeronautics

ABOOK entitled *Motor Fuels, Their Production and Technology*, by Eugene H. Leslie, has recently come from the press of the Chemical Catalog Co., Inc. This book is limited largely to material pertaining to fuel production and refining but contains chapters on the composition of petroleum, the motor fuel problem, alcohol, composite fuels, gasoline specifications and methods of analysis of interest to technical men in the automotive industry. The chapter on blended fuels gives the composition of Alcosgas, Natalite and other fuel mixtures and discusses the suitability for use in automotive engines of benzol and other blending agents when mixed with gasoline.

There are numerous references to books and publications on similar or closely related subjects and an appendix giving many useful tables and physical data relating to motor fuels.

"METALS and Their Alloys" is the title of a book which has been brought out recently by Henry Carey Baird & Co., Inc., to take the place of "Metallic Alloys" by Wm. T. Brannt, formerly published by the same firm. It was found that so many changes had to be made and so much new material had to be added to bring the book up to date that it was decided to give it a new title and publish it under the name of the reviser, Charles Vickers.

The book includes information on the history, production methods, properties and uses of the elements, and

as there are now eighty-six of these known while six others are believed to be successfully hiding their identity, the field covered is wide indeed. The subject is handled chiefly from the standpoint of the foundryman, rather than from that of the engineer who uses metals and alloys as materials of construction. There are several chapters, however, that should interest the automotive engineer, such as Magnesium and Zinc Alloys, Die Castings, Soft Solders and Brazing Alloys, Foundry Utilization of Scrap Metals and Analysis of Babbitt Metals. There is one chapter on Iron Alloys, but it does not go into the subject of alloy steels to any extent.

A little more careful editing of the work would have increased its appeal to the engineer.

TO fill the need of an aeronautical directory which would give immediate information relative to the names of operating concerns, clubs, rules, etc., there has been compiled "The Aircraft Yearbook, 1923." This first issue has been compiled by Charles E. Lee and edited by C. G. Grey.

Although written and published in England, the yearbook is international in scope, with the exception of the "aerodrome" section, which is limited to England. The publisher is Sampson Low, Marston & Co., Ltd., London.

Among other things found in this volume are directories of air companies, air lines, types of aeroplanes, types of motors, legislation, and chapters on air mails,

Economic Surveys Are Business Doctors

Experience and Judgment Must Supplement Figures and Charts on Conditions

By Harry Tipper

JAMES CHANCE, sales manager of the Planet Motor Car Co., Frank Lane, the treasurer, and John Carter, the vice-president, were in the latter's office lingering for some desultory conversation after the business of the conference had been disposed of.

"Say, Frank," said Jim, with his mind switched to another subject, "there seems to be a lot of mystery in this forecasting of conditions by the economists. I have been trying to study some of these economic surveys we get in the office and I must confess I find it hard to make much out of them. Every so often I figure I have something tangible I can hold onto and then I lose it again when I read the next sentence."

"I'm not surprised," smiled the treasurer. "Those surveys are made up primarily from the economic specialist's point of view and they are frequently as easy for the ordinary business man to read as the stomach specialist's diagnosis is for the patient."

"Besides, I have a grave suspicion that they don't know just what the things they are talking about do mean in actual business practice."

"It is comparatively easy to see that every business is related to every other business and, consequently, the variation in activity of one business will indicate something of the variations in other lines."

"There's no difficulty about that," Jim Chance broke in. "I can see that the fluctuations in the price and consumption of raw cotton are distinctly interesting to the manufacturer of cotton goods, but that does not make it possible for me to see how it helps him predict his course of sales for six months."

"Then I get positively stalled on this business cycle which apparently claims that it is necessary for us to pass through periods of alternating inflation and depression. I know we do pass through those periods but I don't see why it is necessary."

A Difficult Question

"Well, of course, the economist might have a hard time answering that if he wanted to," replied Frank Lane. "He is not undertaking to say why, he is just observing the facts as far as he can and then watching the symptoms which suggest the approach of the disease."

"One of my children had a fever not long ago and it was sufficient to bother us. There was some irritation of the throat and other symptoms with it. We called in the doctor and he prescribed some medicine, rest and certain diet for her. I asked him what he thought was the trouble. He said that at such a point in the development of the disease it might be one of three or four things, but he would know a good deal more as the case progressed. Of course, so would I, but what I wanted was to get rid

THE treasurer of the Planet Motor Car Co. gives an informal talk about business cycles and trend surveys, during the course of which he clears up some questions that have been troubling the sales manager.

of the trouble before it became acute and I did not relish his remarks.

"That's about the way that the business cycle strikes me as the economists lay it out. It appears that there is a wave in the general progress of business activity which they call a cycle and they have isolated a few symptoms that go with the changing condition of that cycle but the symptoms may be just a temporary chill from uncertainty, a slight indigestion due to inventory, exhaustion due to too much expenditure of financial energy or it may be a nervous breakdown which requires a long period of slow development to reach normal activity again."

"That's all right, the illustration is all O.K., but if I want to keep healthy I want to know all the slight symptoms and what they mean. So, unless I can apply all that stuff to our business here, how am I to use it?" James Chance questioned.

An Example

"Suppose we carry the illustration a bit further," said the treasurer. "You come in some morning not feeling very good, headache, slight indigestion. You search back for a cause and decide that the fish you ate at the club the previous noon was responsible. You decide to cut down your eating, do without fish or meat for a day or two and take it easy. Next day you feel all right. You speculated as to the cause and you speculated as to the remedy. You would use that same remedy again in a similar case, although you don't know why it operated or how it did the work."

"Now, you don't know enough about yourself to keep well all the time. You learn more as time goes on but you realize that you cannot operate on full schedule right along. Sometimes, you are bound to overload the nerves or the digestion, diminish the sleep or something else. You don't work on a straight line basis, your operation varies up and down."

"Fine, so far, Frank, but where does our business come in?"

"Your state of health is a matter of speculation for next week, or next year, Jim, so is John's and so is mine. Nobody can predict when we will be sick or how. But, the actuary of the insurance company can tell within a small percentage how many people will be sick next year of a certain disease and how many will die from it."

"Now no economist can tell you how to preserve your business health entirely or when the business will be sick, but he can tell you pretty fully what the general trend of all business is from the general calculations. You've still got to exercise your judgment, experience and speculation in fixing what your business will do but the general tendency of all business is a warning signal, an additional

piece of information to help the business man guess right in his own affairs.

"In other words, Jim, any additional information the doctors can secure by studying general health conditions and the insurance people can find out from studying death at different ages, will help you to avoid some things you might be guilty of doing otherwise. For instance, I noticed one insurance actuary had figured out that men over forty years of age were better off if they were somewhat under weight in general. Of course, the statement was made that this did not apply in every case. You wouldn't go crazy and try to cut off a big chunk because you saw that, but you might keep yourself from getting sluggish by watching the thing a little.

"That's about the way I size up this economic information. Mostly you must deal with conditions as you find them in the automotive industry. We are making cars and we must work and produce accordingly, but if I notice that prices are higher than production warrants and there is a tendency to go lower, I may delay buying somewhat. Of course, if money costs are going up, we will try to get along without increasing and probably would decrease our loans."

"Well, that's a sane way to look at it, but these economists seem to make a lot of sensational predictions

and get a lot of people all stirred up over the future, until they get plumb scared. I've got some big distributors in that shape just now. They admit they've got plenty of orders and business is good and they see no signs of a severe let up. They don't know what it's all about but they look upon some of these men as real authorities and are scared of something—they don't know what."

"We've always had those men, though, Jim," broke in John Carter, "and always a lot of people following them. There are many folks who believe the cranks who prophesy the end of the world. Of course, none of them do any good when they yell out like that but, after all, there are many able and experienced economists who are very careful of their predictions and step lightly when they speak of future tendencies.

"The trouble lies in our ignorance of the matter. We see that there is a rise and fall of human activity and that it flows in more or less regular waves, but why it does or what causes the variations, we do not know. We don't know why the variations are so different in different lines. All we can say is, here are certain facts which almost repeat themselves. They look similar but they are not sufficiently alike to make any prognostications about it and they act usually as a warning but will not show the road ahead."

Automotive Development in Azores Slow

Adverse economic conditions have retarded trade. Recovery seems certain but will not be rapid. Better service needed.

ECONOMIC conditions, adversely affected by the depreciation of the Portuguese escudo, are such at the present time in the Azores Islands that the extension of the use of motor vehicles will be very slow for the next two or three years and dependent in a large part on economic conditions in Portugal.

The escudo, quoted at par at \$1.08, now fluctuates around \$0.05 and island currency is still lower, 2500 milreis on the island being equal to only 2000 milreis of Portugal. Crops in the islands and the fishing industry are close to normal, but the prices secured for exported fish, pineapples, hemp and beans are not sufficient to allow for economic prosperity under the above handicap.

Approximately 400 cars, including about 25 trucks, can be found on the islands at the present time, of which over 350 are on the island of St. Michaels. The majority of these are Fords and it was reported that half of all the cars registered were not in use owing to their owners' inability to operate them with their depreciated wages and salaries.

Several bus lines are in operation on St. Michaels, using 1½-ton Ford truck chassis and locally built bodies, transporting passengers and light freight to the smaller towns radiating from Ponta Delgada. A number of Fords and an Itala are used as taxicabs.

Aside from transportation by boat along the coast and bullocks, there is no method of taking goods and passengers to the interior points of the islands, except by motor vehicle.

Agriculture is the predominating industry on all of the islands except one which is devoted to the fishing industry. All of the islands are hilly and in some cases even mountainous.

Optimists on the island hold that the trade will pick up within several years. Señor Fernando D'Alcontara, the

chief automobile dealer, is the greatest of these and is at the present time building a very large garage and display rooms with storage space for about fifteen cars. The use of buses and trucks will undoubtedly increase with a recovery in economic conditions and many persons using carriages today will turn to the motor car as well as many who have no vehicles of any kind at present.

Outside of the garage being built by Señor D'Alcontara there are no display windows in the islands and only small machine shops with very little machinery. Some of the larger cars are sent to Portugal for repainting and major repair work.

Dealers are very difficult to obtain. To get satisfactory representation it would be necessary, however, to find a person or firm who could secure local banking facilities, have him visit the factory and learn the mechanical side of the make, in order to secure a suitable dealer. There are a few mechanics on the islands, the best of whom are none too good.

When the recovery of the buying power of the people is well on its way, sub-agents should be established at Angra and Horta and possibly at one or two other towns of the group. A peculiar psychology of the inhabitants, however, tends toward their going to the main agent, and if possible to the factory, for the merchandise they want. They hesitate to buy from a middleman, even at the same price, and would go to another town or island rather than purchase a car from their neighbor, whom they are afraid is getting an extra commission.

Several accessory stores handle trade. The largest accessory store is in Ponta Delgada, smaller ones being found in other cities of the island of St. Michaels, and one each on the two islands of Terciera and Fayal. Prices are about double those in the United States. Tires, gasoline and oil are also handled.

AUTOMOTIVE INDUSTRIES

AUTOMOBILE

Reg. U. S. Pat. Off.

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Four-Wheel Brakes and Insurance

FOUR-WHEEL brakes are being given practical indorsement by at least one insurance organization. The National Liberty Insurance Co. has announced a reduction of 10 per cent in collision and 5 per cent in property damage rates for cars equipped with such brakes. In making this announcement the company gives as its reason the recent favor found for this type.

Without offering unfavorable criticism it can be said that the relation of four-wheel brakes to accidents has scarcely been established very accurately. The increased braking power furnished undoubtedly makes possible quicker stops. It is not axiomatic, however, to state that quicker stops mean less accidents.

Under certain conditions the ability to stop in minimum time and space will prevent trouble, but in other cases, as in the midst of a line of dense traffic, an accident may be brought about by one car stop-

ping much more quickly than it is possible for those behind it to do.

Sufficient evidence is not yet available to determine just how many accidents are due to braking troubles and how much to other causes. Moreover, all brake troubles which do cause accidents are not necessarily removed by the addition of two more brakes. Improper adjustments may occur with a four-wheel brake rig as well as with other kinds.

It may be that four-wheel brakes actually do lower accident possibilities to the extent indicated in the insurance reduction. Experience will prove the case one way or the other.

Harding—A Martyr to Duty

WARREN G. HARDING is dead and another name has been added to the long list of gallant Americans who have given their lives to their country.

His passing was almost as tragic as it would have been had he been slain by an assassin, as was McKinley, his prototype. When men sacrifice themselves to aid others they are martyrs, and Mr. Harding killed himself in the service of the nation he loved better than his life. He drove himself beyond the breaking point at the call of duty.

His sacrifice will not have been in vain if it forces into the consciousness of the American people a realization that the duties they have imposed upon their Chief Magistrate are heavier than any man can carry conscientiously and live. If Congress at the coming session devises some means to lighten this unbearable burden it will have done something constructive.

The world has joined with the United States in mourning the most untimely death of an honest, courageous, devoted and lovable President. And well it may. He broke himself upon the rack of party policy because he had espoused the cause of world service. He knew better than any other American save his broken predecessor in office that America cannot stand aloof.

It was the irony of fate that a brain embolism, which made Woodrow Wilson a pitiful invalid, should have cost Mr. Harding his life. Both were striving to teach their countrymen a lesson of similar purport.

While we stand with bowed heads and tear-dimmed eyes grieving for the man who gave his life in our service, let there be no selfish apprehension about the course of business. Economic laws and not presidential mandates determine the trend of industry. Calvin Coolidge will pick up the burden Warren Harding found too heavy and he, too, will struggle on.

The President is dead, but the United States still lives. Its distinguished sons never will refuse to serve though they know death lurks in the shadows of the White House.

Make the Farmer's Dollar Buy More

FARMERS are unfortunate because they have acquired a reputation for always having a grouch. People outside the agricultural areas have got the habit of shrugging their shoulders and remarking, "Oh, well, there never was a time when the farmer wasn't sore about something, so why worry?"

Much sympathy has been alienated from the tiller of the soil because he has kicked about such things as daylight saving and the amount of work he has to do. There may be some sane reason for objecting to an extra hour of daylight for the city dweller, but we don't know what it is. It may be true, also, that the farmer works harder than anyone else, averaging the seven days of each week for the fifty-two weeks of the year, but we doubt it. Certainly his mental strain is not so great and he is at least working for himself.

If he hadn't protested quite so vigorously about so many relatively trivial things, there would be more general sympathy for the plight the farmer finds himself in today. As conditions stand he has very just grievances and has a perfect right to his grouch. He has had for the last three years.

The farmer's dollar in May, as expressed in terms of other products, and assuming that his dollar in 1913 stood at par, was worth 71 cents.

It has steadily advanced, however, since the low point of last August and September, when it was worth 64 cents, but much of this gain has been due to cotton and wool prices, and millions of farmers don't raise either, so they're no better off.

The purchasing power of everybody's dollar has diminished, but most of them have more dollars than the farmer as compared with the number they had in 1913. They get them by means of larger earnings, salaries or wages. That's the rub. The farmer doesn't work for wages and his income is derived from what he grows. The prices of his products have shrunk sadly in the last three years, although his overhead for labor and materials have not declined in proportion.

The following table of wholesale prices, compiled by the Northwestern National Bank of Minneapolis, tells a little of the story:

Commodity	July, 1913	July, 1920	July, 1923
Wheat, per bu. ....	.91%	3.02½	1.10%
Corn, per bu. ....	.57%	1.55	.72½
Oats, per bu. ....	.38%	1.02	.37
Cattle, per cwt.	7.75	10.50	8.75
Hogs, per cwt.	8.69	14.05	6.43
Butter, per lb. ....	.25½	.54½	.36
Eggs, per doz. ....	.18	.40	.19
Poultry, per lb. ....	.13	.35	.16

Most farm products evidently have reverted to the well-known normalcy, but few others have. It is scarcely to be wondered at, therefore, that the producers of these commodities are not happy.

Much has been heard in the last couple of years about the "farm blocs" in Congress. The members have been dominated by farmer constituencies and they have been groping for relief by legislation from economic conditions. Many laws have been passed, but few have been really helpful, except those relating to credits. The tariff was heralded as a panacea for farm ills, but all it has done has been to limit foreign markets for his products and keep his prices down. Now he wants the Government to guarantee wheat prices.

The farmer, long classed as an incurable conservative in politics, has become radical. He is discontented and he proposes to take it out on the politicians so far as he can. If Magnus Johnson doesn't work miracles for Minnesota, for example, it will be a case of thumbs down for him in his home State.

This farm discontent is dangerous and it is a problem which concerns the entire country. We never can have full prosperity until all prices are balanced. It behooves industry generally, therefore, to give a thought to the farmer and do whatever it can to equalize prices. The automotive industry has shown the way and every other industry should follow suit so far as possible. That will help vastly more than legislation to restore the farmer to a buying mood.

The subject is one of vital interest for automotive manufacturers, because they had counted on selling a large part of their output for the remainder of the year in farm districts and the volume of their business there promises to be much smaller than they had expected. J. D.

INDUSTRY ENJOYS STABLE POSITION

PRODUCTION for the month of June shows a falling off of between 15 per cent and 20 per cent.

This decline is to be expected in view of the very large production during the first six months of the year and the percentage of decline does not suggest poor business.

General business outside the automotive field is in an area of uncertainty; commitments are being made only for immediate delivery; prices are uncertain and volume is spotty.

The weak features of the automotive situation are:

- (1) The declining volume of general business in the farm districts, suggesting that these districts cannot be depended upon to keep up the automobile production during the slack seasons in other territories.
- (2) The uncertainty of general business, which is becoming somewhat more pronounced as the season progresses.
- (3) The smaller profit on the volume which is being secured in general business in comparison with previous years.
- (4) Automotive sales have been running at 30 per cent above the line of general business and this disparity may not continue in the same volume.

The strong features of the situation are:

- (1) The automotive industry has kept its prices down

so that they represent a larger value in proportion to the raw materials and labor in comparison with other commodities and this is a good time for the public to buy automobiles.

- (2) The drop in production is not any larger than was to be expected—in fact, it is a little smaller than the conditions of general business would warrant.
- (3) The automobile business is closer to the public than many other lines of general business and is not so much affected by the actions of intermediate fabricators and jobbers.

Taking the outlook as a whole, general business is not as good as it was in the spring and the prices of farm products do not warrant any large expectations from the farming areas. It is probable that the automobile business will suffer a further decline in production but that in proportion to general business its sales will continue good, especially if there is renewed activity in the fall. In comparison with many other lines of business the automobile business enjoys at the present time a more stable position in the eyes of the general public, due to the improvements in cars themselves and the comparatively larger value for the money expressed in automobile prices. It is likely, therefore, that the uncertainties indicated in the general business situation, while they will be felt in the automotive field, will not have their full effect so that in comparison with general business the automotive industry should show favorably.

Sales Reported Running High in Spite of Seasonal Decline

New York

NEW YORK, Aug. 8—Despite new models and rumors of new models, motor car business in the metropolitan district remains remarkably steady. July sales naturally were below June's, but the downward trend was slight, probably on the whole not more than 15 per cent. July business generally was better than the same month a year ago—in some instances 100 per cent better.

The first week of August opened surprisingly strong in all price classes. This was particularly noticeable in the cars selling above the \$2,000 mark. The flurry of new models and new model rumors is expected to contribute somewhat to the slowing of business late in August. Public interest already is being strongly manifested by the crowds which daily visit the salesrooms where particularly striking model changes are being shown.

Strong demand for closed models in all price classes continues, but the open model spurt, which was particularly noticeable early in July after a rather disappointing spring, is beginning to show signs of weakening. This is to be expected, with public interest naturally turning more strongly to closed jobs as winter approaches.

Conservative trading in most establishments, coupled with a healthful de-

mand, has placed the metropolitan used car situation in a quite favorable position.

Boston

BOSTON, Aug. 6—Motor car dealers are entering August, with its vacation period, hoping that business will continue to keep up reasonably good. During July there was a falling-off in wholesale sales. This applied to cars of all classes. The retail business showed a let-up also, but it was not so very pronounced as in others years. Compared with the business that had been done earlier, though, it was evident that the steady rush was not continuing.

There is a falling-off generally about the latter part of the month in the classes under \$1,500, due to the annual announcements by some of the big producers. This has been felt again this year. A number of dealers renew their contracts in July, and so they generally try to be cleared up before August.

The used cars continue to sell well, and the prices hold up good, particularly on the closed models of the popular-priced cars. There are not many on hand among the Boston dealers and those of the outside territory. Generally speaking, the Boston men are not worrying, but plan to work harder to brace up the sub-dealers a bit and so continue the sales more energetically.

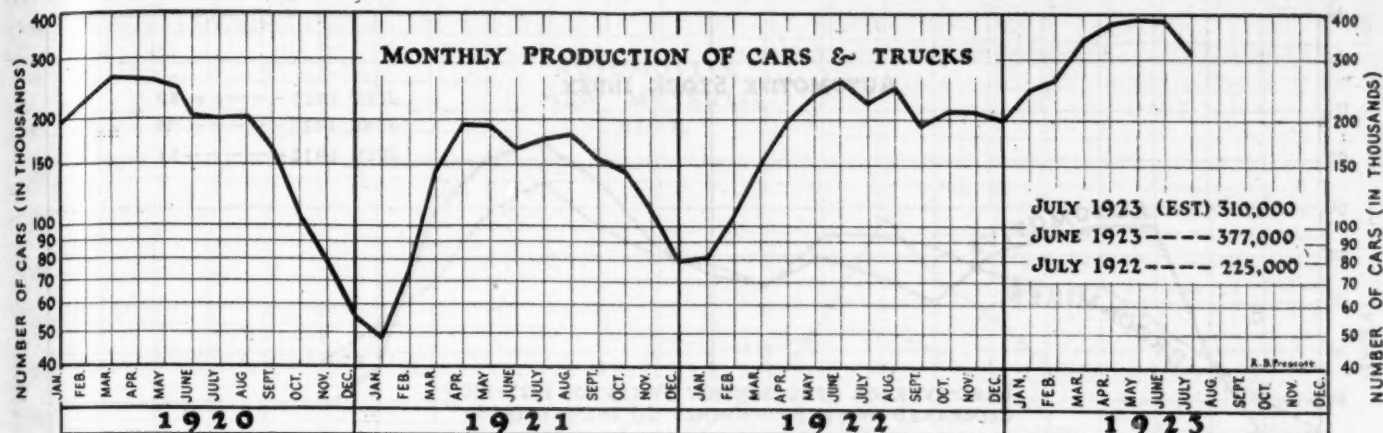
Philadelphia

PHILADELPHIA, Aug. 6—The seasonal slump here has been gradual and not sudden at any time up to the present. Conditions are best described as normal for this period of the year. Passenger cars in general are moving fairly well, but it is noticeable that a switch already has begun from favoring open models to demanding closed models again, the latter having, however, only a slight lead over open cars. There is no doubt that in the aggregate the purchase of closed models—or rather the orders coming in for them—exceeds that of last year at this time.

Numerous dealers have had difficulties in obtaining deliveries from factories, and some assert that they could have sold many more cars had deliveries been made on them. Under such circumstances, it is not surprising that supplies of new cars in the hands of dealers are, in many instances, much lighter than is customary at this season. In no case can stocks be described as more than moderate.

The farmers, who were buying cautiously a month ago, have begun to show more interest in passenger cars, and in the districts about Montgomery and Monroe Counties especially have been buying fairly well since the middle of July. Used cars still remain sluggish.

JULY PRODUCTION TOTALS 318,000



Output 16 Per Cent Below That of June; Better Than Normal

NEW YORK, Aug. 8—There being no August meeting of the directors of the National Automobile Chamber of Commerce, the monthly report on production was delayed a week. The estimate, based on shipping returns, came through today, however, placing July production of cars and trucks at approximately 318,000, a reduction of only 16 per cent over June, when the final and revised figures placed the production at 376,882.

This drop was to be expected because of the seasonal slump which usually comes in July. This time, though, it was not as great as usual, which speaks well for the healthy condition of the industry at the present time. Statisticians tell us that 20 per cent is the normal reduction that can be figured on, so it would seem as if the industry is more than holding its own.

New Models Slow Output

Manufacturing conditions in July were against a record month. Not only was there the usual seasonal slump but on top of this several of the biggest producers like Buick, Studebaker, Dodge, Hupmobile, Nash and Jewett came out with new models which necessarily slowed production in those plants to a most noticeable extent. This also is likely to have an influence on August production, although it is expected that August will show a gain over July.

Reports from Detroit, Toledo, Cleveland, South Bend and other centers lead to the belief that many of the factories

Estimate of Production Last Month Shows Decline of 16 Per Cent as Compared with June Output of Factories

NEW YORK, Aug. 7—Shipping figures compiled by the National Automobile Chamber of Commerce for July give an estimated production of 318,000 cars.

The following table gives the statistics for the first seven months of this year and for the months of 1922:

	Output		Carloads		Driveaways		Boat	
	1923	1922	1923	1922	1923	1922	1923	1922
January	243,104	91,109	35,223	15,357	30,027	7,479	728	143
February	276,467	122,366	36,147	19,636	43,600	10,173	882	180
March	354,319	172,720	44,372	27,758	62,656	16,917	1,940	560
April	382,001	219,558	44,977	31,334	59,522	22,381	4,869	2,960
May	393,163	256,219	46,100	33,416	60,550	28,827	12,050	7,406
June	376,882	289,011	40,550	34,230	57,500	33,857	13,500	7,737
July	318,000	246,607	31,600	29,116	43,000	28,100	9,570	7,030

Factory shipments for the other months of 1921 and 1922 and output for 1922 follow:

	Output	Carloads		Driveaways		Boat	
	1922	1921	1922	1921	1922	1921	1922
August	272,589	20,758	32,814	15,218	36,754	3,595	10,096
September	206,849	19,002	25,950	13,840	30,055	2,959	8,002
October	237,611	17,806	26,980	12,971	33,320	2,226	7,040
November	236,887	14,264	27,232	10,528	27,376	1,402	5,070
December	227,319	12,100	26,900	7,500	27,500	134	1,300

Motor vehicle production segregated as to cars and trucks is as follows:

	1922			
	Cars	Trucks		
January	81,693	9,416	November	215,284
February	109,171	13,195	December	207,269
March	152,959	19,761		
April	197,216	22,342		
May	232,431	23,788		
June	263,027	25,984		
July	224,770	21,837		
August	248,122	25,467		
September	187,661	19,188		
October	216,099	21,512		

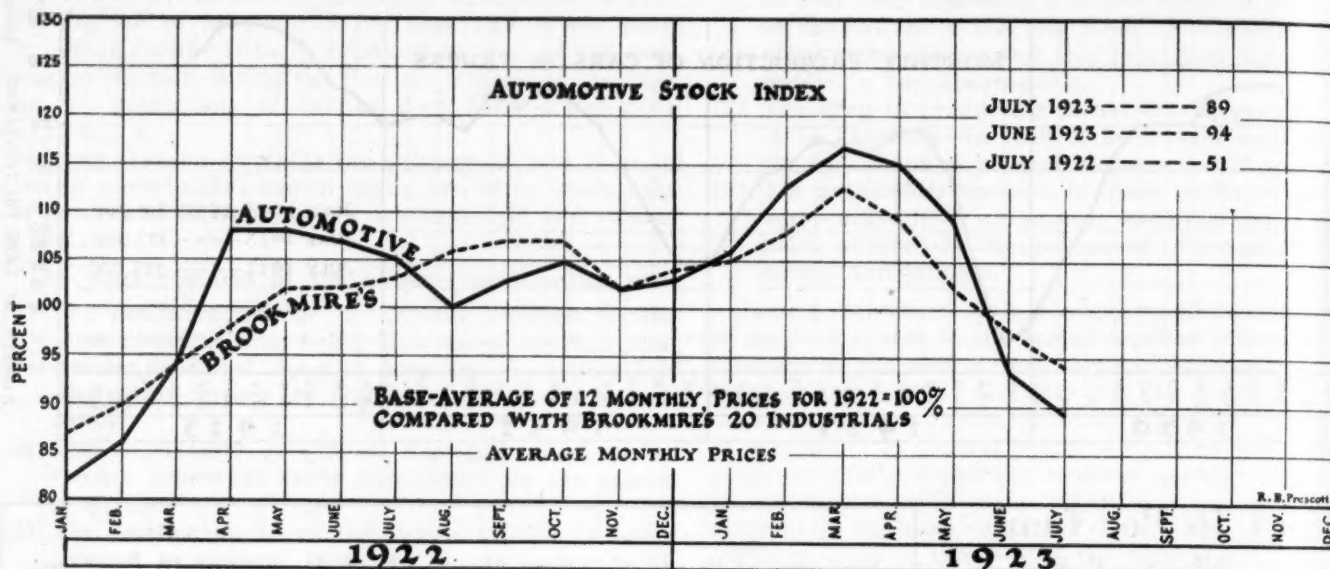
from 57,500 to 43,000, while boats carried only 9570 in comparison with 13,500 in June.

No longer do automobile manufacturers have to worry about getting their products to market. The railroads are functioning better than ever and the industry seems to have no trouble in getting all the freight cars needed.

will be running strong most of this month. Ford shows no signs of slowing down; indeed, it would seem as if every week results in a production record being broken by Ford.

The Chamber's report as to shipping shows a decline in all three methods of delivery in July. Carloads dropped from 40,550 to 31,600; driveaways decreased

AUTOMOTIVE STOCKS DROP LOWER



Stock Movements Shown by Quotations on Exchanges

New York Exchange

	July 3	Aug. 7
Ajax Rubber	63 3/4	5 1/2
American Bosch	29 1/2	30 1/2
American La France	103 3/4	105 3/8
American La France pfd.	95	95
Case, J. I.	34	33
Case, J. I. pfd.	70	68
Chandler	46 1/4	47
Continental Motors	6 7/8	7 1/4
Eaton Axle & Spring	23 1/2	23 1/2
Electric Storage Battery	53	54
Emerson-Brantingham	2	1 1/2
Emerson-Brantingham pfd.	15	6
Fisher Body	140 1/2	152
Fisher Body of Ohio	94	98 1/2
Fisk Tire	7 1/2	7 1/2
Gardner Motor	8 3/4	7 1/2
General Motors	13	13 3/4
General Motors pfd.	80	79 1/2
General Motors 6%	81	78
General Motors 7%	95 5/8	95
Goodrich, B. F.	20 1/4	20 1/4
Goodrich, B. F. pfd.	44	78 1/2
Goodyear Tire pfd.	79 1/2	44 1/2
Goodyear Tire pf. pfd.	94 3/4	92
Gray & Davis	7 1/2	7 1/2
Hayes Wheel	32	33 1/4
Hendee Mfg.	12 3/4	12 1/8
Hudson	20 1/2	22
Hupp	17 1/8	18 1/4
Inter. Harvester	76 1/2	72 1/4
Inter. Harvester pfd.	108 1/2	108 3/4
Kelly-S Tire	20	30
Kelly-S Tire 6% pfd.	87	78
Kelly-S Tire 8% pfd.	95	95
Kelsey Wheel	95 1/2	95 1/2
Kelsey Wheel pfd.	100	97
Keystone Tire	4 1/4	4 1/4
Lee Rubber	18	18 1/4
Mack Truck	65	70
Mack Truck 1st pfd.	65	93
Mack Truck 2nd pfd.	72 1/2	80
Marlin-Rockwell	7	7 1/4
Martin-Parry	27	26 1/2
Maxwell Motors A.	36 3/4	37 1/2
Maxwell Motors B.	107 1/8	113 1/4
Moon Motors	21 1/8	21

Mullins Body	14 1/4	12
Mullins Body pfd.	90 1/4	90 1/4
Nash Motors	91 1/2	91 1/2
Nash Motors pfd. A.	97 1/2	97 1/2
Ohio Body & Blower	4 3/4	4 3/4
Packard	12 3/4	12 1/2
Packard pfd.	92	93 1/2
Parish & Bingham	9 1/8	9 1/8
Pierce-Arrow	6 5/8	7 5/8
Pierce-Arrow pfd.	15 1/2	17 3/4
Pierce-Arrow pf. pfd.	59 1/2	62 1/4
Reynolds Spring	14	18 1/2
Spicer Mfg.	12	13 3/4
Spicer Mfg. pfd.	90	89
Stewart-Warner	75	83 1/2
Stromberg Carburetor	60	63 3/4
Studebaker	98 3/4	101 1/8
Studebaker pfd.	110	115
Timken Roller Bearing	35	36 3/8
U. S. Rubber	37 3/4	37 3/4
U. S. Rubber 1st pfd.	94	90
White Motor	45 1/2	47
Willys-Overland	57 1/8	7 1/8
Willys-Overland pfd.	61 3/8	65 1/2
Wright Aero	9 1/2	9 1/2

New York Curb

	July 3	Aug. 7
Aluminum Manufactures	22 1/4	22 1/4
Cleveland Motors	25 1/2	26 1/2
Durant Motors	42	42
Durant Motors of Ind.	10 1/4	10 1/4
Ford of Canada	420	410
Goodyear Tire	10 1/2	10 1/8
Motor Wheel	11 1/4	11 1/4
National Motors	1 1/2	1 1/2
Paige-Detroit	19 1/2	19 1/2
Peerless Motors	32 1/2	31
Reo	14 5/8	16 3/4
Roamer Motor Car	103 1/8	103 1/8
Stutz	14 1/8	14
Timken-D Axle	9	8
Timken-D Axle pfd.	83	83
Willys Corp. 1st pfd.	5	4

Philadelphia

	July 3	Aug. 7
Electric Stor. Bat.	54 1/2	54 1/2

Chicago

	July 3	Aug. 7
Bassick-Alemite	21	22
Borg & Beck	25 1/4	25 1/2
Chicago Coach	90	87
Continental Motors	7 1/8	7 1/8
Gill Mfg.	18	18 1/2
Hayes Wheel	32	34
Hupp	17	18 1/4
McQuay-Norris	17 3/4	19 3/4
Reo	14 5/8	16 1/8
Stewart Motors	75 1/4	75 1/4
Stewart-Warner	74 1/4	84 1/8
Yellow Mfg.	22 1/4	24 1/4

Detroit

	July 3	Aug. 7
Continental	7 1/8	7 1/8
Edmunds & Jones	34	34
Ford of Canada	408	408
Motor Products	99	106
Motor Wheel	9 1/4	9 1/4
Packard	12 3/4	12 3/4
Packard pfd.	92	94
Paige	17 1/4	20
Reo	14 3/4	16 1/8
Timken-D Axle	9	8 1/4

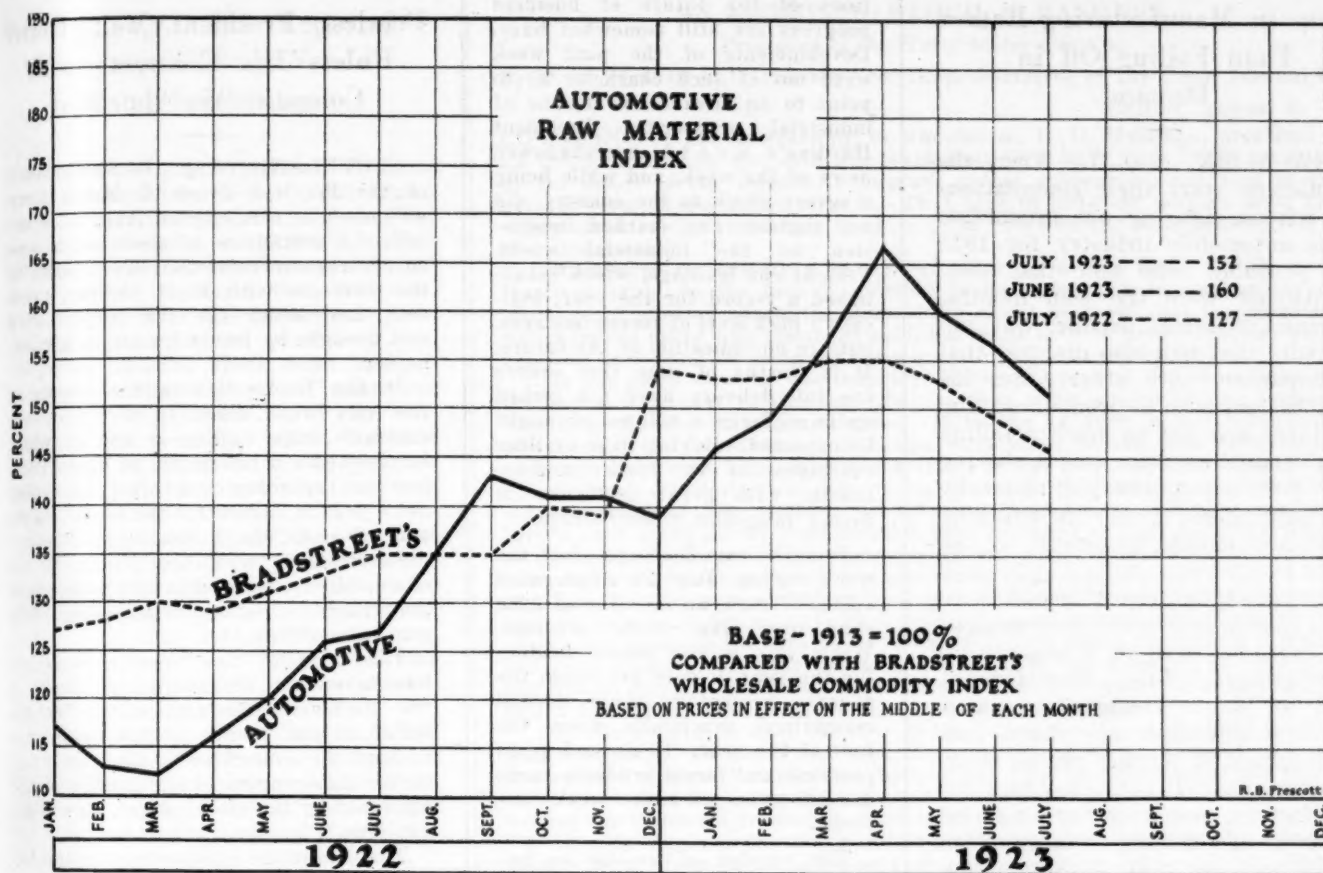
Cleveland

	July 3	Aug. 7
Firestone	70	64
Firestone pfd.	81 1/4	81 1/4
Fisher Body of Ohio	98	98
Goodyear	10 1/2	10 1/2
Goodyear pfd.	44 1/4	44 1/4
Jordan pfd.	86	86
Miller Rubber pfd.	99	99
Peerless Motors	33 1/2	30 1/4
Stearns, F. B.	19 1/8	19 1/8
White Motor	47	47

Boston

	July 3	Aug. 7
Gardner	9	9
Gray & Davis	8 1/2	8 1/2
Greenfield Tap & Die	16 3/4	17
Hood Rubber	54	54

MATERIAL COSTS CONTINUE TO FALL



July Business Surprises Dealers in South and West

Birmingham

BIRMINGHAM, ALA., Aug. 6—Automobile sales in Birmingham and throughout the Birmingham territory have been better during the present summer than during any like period in the past five years. The expected seasonal slump arrived on time, but sales were far above the average for the same period in past years. Sales conditions for automobiles in the lower-priced classes began to improve during the latter part of July, and with the beginning of August were apparently on the road to the high sales-records made during the spring of the year. Higher-priced cars in Birmingham proper have been selling at a steady pace. In the territory surrounding Birmingham they have not been moving very well.

Used-car trading has arrived at a point where it is merely a question of price. If a dealer is wise in taking in used cars, he can dispose of them at a profit without delay. On the whole, the used-car situation is much improved in Birmingham and the surrounding territory, in spite of the enormous volume of trade-ins during the past six months.

Closed cars are selling ahead of anything ever before known in this section for the season of the year. With the

approaching fall it is expected that at least 50 per cent of all sales will be closed models, if they are available. No large stocks are being accumulated by the dealers of either open or closed models.

The farmers purchasing automobiles at present are those who are independently wealthy; the general farmer trade has not started in this section to date. It is expected to begin late in August and increase in volume each succeeding month until spring.

The dealers throughout the Birmingham territory are looking for excellent sales during August.

Salt Lake City

SALT LAKE CITY, UTAH, Aug. 6—The summer slump is not as marked as last year. One dealer says there is none as far as he is concerned. He says he is increasing advertising appropriations to offset it. Demand for closed cars is marked. The proportion, according to one firm, is "four or five open cars to fifty or sixty closed." Others confirmed this. Used cars are moving. Farmers have not started buying yet, but dealers are confident business with them will be good this fall.

St. Louis

ST. LOUIS, MO., Aug. 6—Although the heaviest buying season of the automobile trade is supposedly over for the summer, there is no complaint among dealers here about business. Sales are maintained at a high level and new impetus has been given the business with the bringing out of the new models of various lines. The sale of closed cars has been the outstanding feature of the present season and some dealers expect this decided preference for the closed car to be even more pronounced in the future.

Farmers have not as yet finished their active work season, and while they are doing some buying, it is not of as great a volume as may be reasonably expected within the next sixty days, when their harvest will be made and their products sold.

With the new models just brought out, the used car market has taken a small slump. There is a disposition on the part of the dealers to be more conservative with allowances on used cars and their resale value will be a deciding factor.

(Conditions in other cities on pages 304 and 305)

New Models Slowed Production in July

Slump in Manufacturing Rather
Than Falling Off in
Demand

NEW YORK, Aug. 7.—When the statisticians start their compilations next winter, figuring out production in the automobile industry for 1923 they probably will find that July and August were the lean months, the usual seasonal decline, but undoubtedly they will also discover that in comparison with other years the slump has not been so pronounced, and that there was not so much a falling off in demand as there was a slowing up in production, brought about by legitimate causes, largely the bringing out of new models by several of the largest companies.

July showed a drop of about 15 to 18 per cent in production as compared with June, but even so, it was the industry's biggest July. Therefore, it would not be surprising when manufacturing difficulties are taken into consideration, if August ran to about the same total. It is no easy task for a big factory, preparing for the introduction of new models, to taper off on the old and yet hold the production pace. Yet several of them had to do this in July, some coming to a dead stop. Therefore, it is figured that before these big plants can get into full swing again, August production is going to suffer somewhat.

Heavy Fall Sales Expected

Granted that after August production will snap back, it would seem as if it is going to be possible for the industry to put out 3,000,000 cars and trucks this year. Up to now more than 2,000,000 have been turned out, and even if the pace the rest of the year was no faster than in the last five months of 1922, this manufacturing feat would be easy of accomplishment. In this period last year nearly a million and a half of cars and trucks were built, and it would seem logical to expect that the rate of last year's production in August, September, October, November and December will be maintained.

Advices from the factories are to the effect that dealer demand is brisk and that there is no apparent slackening in wholesale orders. There are no surface indications of a diminution in this demand, either, and dealers who are filing orders for the fall apparently are convinced that they will have little trouble in disposing of cars.

Business in Brief

NEW YORK, Aug. 9.—Indications of the future of business progress are still somewhat hazy. Developments of the past week were not of such character as to point to an advance or decline of industrial prosperity. President Harding's death overshadowed news of the week, and while being a severe shock to the country, did not register any marked impression on the industrial world. Freight car loadings, which established a record for the year, indicate a high level of recent business, but are no indication of the future. It is worthy of note that orders for fall delivery have not picked up in as large a volume as might be expected. Buying in most lines continues to be from hand-to-mouth, with great hesitation in giving long-time commitments.

Freight car loadings for the week ending July 21 aggregated 1,028,927 cars, an increase of 9260 cars over the week previous. While this is the record loading for the year, it does not reach the average percentage above normal maintained practically from the first of the year. Grain and grain products and forest products made decided gains over the week previous.

The number of employees has been reduced in the cotton and woolen textile mills of New England, and plants in many places are operating on a light schedule or are shut down. Seasonal decline in production is to be expected, but there is some indication that the reduction is more than seasonal and follows a new business trend.

Federal Reserve rediscounts increased some \$52,000,000 after some weeks of steady decline. Whether this factor evidences greater inflation has yet to be seen. The European situation is being felt more and more in this country, and other manifestations may appear besides that of a shrinkage in the grain market.

More so than ever before, the introduction of new models on Aug. 1 will no doubt bolster up fall business. At least four of the big producers brought out new models on that date. One of these is a concern which has run along several years without any decided changes in style. Four-wheel brakes, too, have added interest to some of the newcomers; so, taken all in all, retailers can look for a good fall business, while the manufacturers, of course, will be made correspondingly happy.

Collins Demands O.K. of His Stockholders

Peerless President Will Retire
Unless His Contracts with
Company Are Approved

CLEVELAND, Aug. 7.—Stockholders of the Peerless Truck & Motor Corp. will meet in this city on Aug. 17 under call of a committee of directors to pass on certain contracts that were made by the directors with R. H. Collins, president, and which are the subject of a suit brought by David Rockwell, a stockholder.

In the Rockwell suit, the courts of this city were asked to set aside the contracts with Collins in one of which he received a bonus of \$65 on every Peerless car manufactured after \$1,000,000 net a year is earned for the stockholders, and to annul the purchase by Peerless directors from the Collins Motor Car Co. of machinery, tools, dies and model cars, and plans, designs, engineering data for automobiles.

The head of the Peerless company has taken up the challenge issued in the Rockwell suit and, strong in the belief in the justice of his cause, has notified the committee of directors "that unless these contracts are reaffirmed and approved by the stockholders, he will not continue."

The committee of directors in the letter to stockholders states that: "We have Collins' resignation effective Aug. 20, to be presented to the board, if the stockholders vote against approval. We also have a letter from him, stating that if the stockholders do approve the action of the board in making these contracts, he will cancel his present contract, including the bonus of \$65 a car as of Jan. 1, 1923, and continue with the Peerless Motor Car Co. on a compensation basis to be fixed by this committee."

One of the most important announcements made by the committee of directors in its letters is "that the standardization of the eight-cylinder car having been effected, the company's financial position now warrants putting into pro-

(Continued on page 298)

Carnegie Steel Is First to End 12-Hour Shift

NEW YORK, Aug. 8.—The Carnegie Steel Co. of Sharon is the first to eliminate the twelve-hour shift. The eight-hour turn becomes effective Aug. 16, the works to receive a flat increase in wages of 25 per cent. Laborers who were working ten hours or more and go on the eight-hour turn will receive fifty cents an hour instead of forty. Rolling departments will work on ten-hour shifts, instead of twelve. It is expected that other subsidiaries of the United States Steel Corp. will take similar action shortly.

Willys' Half-Year Shows Big Earnings

Net of \$7,932,385 Reported—
Company Without Note or
Bond Indebtedness

TOLEDO, Aug. 7.—The financial statement for the first half of 1923 issued by the Willys-Overland Co., showing net earnings estimated at \$7,932,385, after allowances for interest, taxes and special reserves, indicates that the company now is in its most prosperous year.

Coincident with the statement and condensed balance sheet came the announcement that the entire remaining balance of \$6,943,000, due on the outstanding first mortgage bonds, has been authorized by directors to be paid this week, leaving the company without any note or bond indebtedness.

Of the earnings shown for the first six months more than \$2,000,000 was earned in June. The balance sheet shows \$7,248,321 cash on hand; notes and accounts receivable of \$4,510,863, and merchandise inventories of \$26,430,165, for a total of \$38,023,069 current assets. Current liabilities are \$11,290,582.

During the year which President John N. Willys has been back on the job at Toledo, the company has moved up from fourteenth place to second place among the members of the National Automobile Chamber of Commerce in production, it is claimed. During the half-year 107,062 cars were produced—76,453 Overlands and 27,244 Willys-Knights.

One of the big factors in the continued high production was the introduction of the new Red Bird car this year. Sales of the new car have been maintained at more than 200 a day since the car was announced in May.

The company has increased its dealer list from 3074 last January to 5561 at the present time, and President Willys says the list is increasing more rapidly now than at any time during the year. Present plans call for increase of capacity.

(Continued on page 303)

Tire Producers Announce Cancellation of Bonuses

AKRON, OHIO, Aug. 6.—Ten per cent bonuses, which have been paid to factory employees of most of the major Akron companies, have been cancelled, effective the first August paydays in such factories. The bonus cancellation is tantamount to a 10 per cent wage decrease.

Factories announcing discontinuance of the bonuses include Goodrich, Firestone, Miller and Mohawk. Goodyear is expected to follow suit.

Several months ago, when the rubber industry rode on the crest of what later developed to be a rather short-lived boom, rubber workers made repeated demands for wage increases, but factory officials reiterated their contention that

Car Makers Lengthening Wheelbases to Give Improved Riding Qualities Demanded By Purchasers

AN INTERVIEW WITH C. D. HASTINGS,
President of the Hupp Motor Car Co.,

By D. M. McDONALD, Detroit News Representative of the Class Journal Co.
Detroit, August 6.

SPEAKING of the lengthening in wheelbases, C. D. Hastings, president of Hupp Motor Car Co., said this week that they have been made necessary by the desire of car makers to improve spring suspension, and also to give greater room in the bodies of cars. That cars by different makers must have riding qualities in proportion to their price explains the simultaneousness of the movement.

Wheelbase is entirely a matter of what an owner looks for in a car, Hastings said. In the face of existing traffic congestion in some cities and shortage of parking space, the supposition might be made that the movement would be the other way about, he said, but while owners desire superior riding qualities cars must be designed entirely with this thought in view.

In the early days of the industry, Hastings recalled, the wheelbase was the mark of quality in the car. Buyers then were guided by the imposing length of the car in a large degree. With the advance in the development of cars and the improvement of roads, wheelbases became less important in owners' minds, until today they are matters of but minor consideration.

General stimulation of buying is expected by Hastings to follow the announcement of new models. In bringing them out at this time manufacturers have acted on the consideration that this time of year is ordinarily one of diminished selling and the new models not only revive owner interest but give dealers valuable assistance in promoting sales campaigns.

The effect of new models on used cars in dealers' hands should not be important, he said, if dealers have been guided by good merchandising judgment in allowances made on the cars when taken. The fact that a used car is relegated one more model to the rear should not cause it to lose sales value. What the car will do and the condition it is in generally, is the important thing, he said, and if taken in on that basis its value should not be affected.

Of the general market for cars in the latter months of the year Hastings was optimistic. He noted that with the exception of wheat, farmers generally are assured of a good market for their crops. This should result in the placing of many cars on the farms, he said, and buying of other necessities would work toward the increased prosperity of all other lines.

Despite the tremendous expenditures that have been made by the American people as a whole in the past several years, he said, bank deposits show a steadily increasing total, indicating the tremendous buying power of the country. It also indicates that people are buying rationally and in proportion to their incomes. Where conditions are as generally favorable as this, he said, there is no reason to doubt that the automotive industry will continue to receive its proper share of attention.

conditions did not justify permanent wage advances.

To meet the persistent demands, several companies instituted the bonus plan. One factory in initiating the movement gave the bonus for steady attendance at work. But when other companies offered commensurate bonuses without any attendance restrictions or conditions, the first followed suit and all gave a bonus to all factory workers.

The action of the rubber companies in this respect followed the advice of Roger Babson, who shortly before had suggested the bonus plan in lieu of permanent wage increases, on the ground that when conditions necessitated wage reductions it would be far easier to quietly discontinue the bonuses than to tell factory workers wages would be cut.

Although tantamount to a wage cut, the discontinuance of the bonus has not had quite as severe an effect upon the workers as undoubtedly a flat announcement of wage cuts would have had.

The bonus cancellations follow in natural sequence the recent tire price reductions, which admittedly were unwise and unwarranted. Financial experts have declared that tire prices now are too low to warrant sufficient earnings.

Price War Brings Lower Gasoline in California

SAN FRANCISCO, Aug. 2.—The Standard Oil Co. on Aug. 1 announced price of seventeen cents a gallon for gasoline throughout California, and next day the Associated, Union and Shell companies made the same announcement.

Price-cutting war between independent dealers and service station operators in Southern California is responsible for the reduction, gasoline having sold as low as eleven cents a gallon in Los Angeles the last week in July, but this is the first reduction by the Big Four from the price of nineteen cents, which has prevailed for about one year. At the same time Standard announced reduction of price it will pay for crude oil in San Joaquin Valley to same price it is now paying at Los Angeles, which is a cut of forty-one cents a barrel for thirty-five degree and up gravity oil. Not since 1914 has gasoline sold at seventeen cents throughout the State. State reports to San Francisco automobile dealers from southern end of the State indicate that independents will make further reduction in effort to compel the Big Four to come still lower.

Further Tire Price Cuts Not Expected

No Concern Willing to Take Lead
—Recent Reductions Slowed
Up Sales

AKRON, Aug. 7.—Although one Akron manufacturer is known to have seriously considered initiating another tire price cutting movement, it is stated authoritatively that he has been dissuaded by his associates and that if prices are to be cut, some one else will have to take the lead. It is also stated that practically no other company is willing to do this.

When Firestone inaugurated the price-cutting movement a few weeks ago, although other companies followed suit, condemnation of the Firestone action was heard on all sides—from manufacturers, jobbers and retailers.

Admittedly, too, the price cuts had exactly the opposite effect from what had been anticipated. Instead of stimulating sales, the price reductions slowed up tire sales. Motorists had just begun to buy on the theory that other price boosts might be expected, when the drop came, and they naturally held off, anticipating further reductions.

The result has been a sluggish movement of tires to consumers; overstocking of warehouses with finished goods; slowing down in factory schedules, material reduction in daily output and the laying off of several thousand men in the Akron district alone.

Production Has Declined

Tire production now is not 60 per cent in Akron of what it was six weeks ago, and its recovery will be slow, as abnormally heavy inventories of finished goods will have to be liquidated through the consumer sales channels before production can again be increased.

Many manufacturers have adopted strenuous programs in an effort to stimulate sales and to convert excessive tire stocks into cash. The Mason Tire & Rubber Co. of Kent, for instance, has announced a strict cash-to-dealer-to-consumer plan, urging dealers to buy only two weeks' stocks ahead. Mason officials claim the plan has netted 2000 new accounts the first month and cash collections of nearly \$50,000 a day. The plan, they say, helps the dealer to get a quicker turnover, while the cash transactions with dealers, officials claim, have reduced sales expenses materially and have justified the continuance of the policy indefinitely.

R. & V. NOTES EXTENDED

MOLINE, ILL., Aug. 6.—Stockholders of the Root & Van der Voort Corp. have been notified by President Holder that the balance of \$300,000 outstanding on the Root & Van der Voort Engineering Co. collateral notes has been extended to Aug. 1 by the Boston interests

WANTED—SUBSTITUTE NAME FOR "DRIVER"

PONTIAC, MICH., Aug. 6.—The General Motors Truck Co. contends that one of the greatest problems facing the motor truck industry is the improving of the driver's morale, his work and care of the truck, through making the place more attractive. It is pointed out that the word "driver" signifies nothing, beyond its exact dictionary meaning. It is asserted that while many Americans are employed driving motor trucks the individual owner and fleet operators have found that they have a problem on their hands to instill a certain amount of pride in the drivers. With this thought in mind the General Motors Truck Co. has inaugurated a contest, which is open to all its employees and the sales force throughout the country. The company is asking employees to submit a substitute name for "driver" which will signify just what class of vehicle they are operating. A prize is being offered for the winning name, which is to be judged by a number of truck experts.

in order to permit a reorganization of the companies and the consolidating of stockholders' interests into one operating company. President Holder declares that these notes remain in control of the whole situation and must be met by stockholders if they are to regain practical control of the companies.

Cox Brothers and Eaton Axle Become Affiliated

CLEVELAND, Aug. 6.—Announcement is made that the Cox Brothers Manufacturing Co., making Cox bumpers, has joined forces with the Eaton Axle & Spring Co. of this city and will constitute the bumper unit of that organization. The Cox brothers will remain in charge of the bumper plants, which are located in Albany and Cleveland. William G. Cox of Cleveland will have general charge of sales and distribution, and Theo. M. Cox of Albany will be in charge of production. In addition to the present factory service branches in New York and Chicago, there will be similar stations in Boston, Philadelphia, Albany and Cleveland.

The Eaton company now consists of the Eaton axle and spring plant, the Torbenson axle plant, Perfection spring plants at Cleveland and Pontiac and the Cox plants at Cleveland and Albany.

The Cox Brothers Manufacturing Co. was formerly known as the Cox Brass Manufacturing Co., which was established in 1872 at Albany. The Cox brothers began building bumpers in 1909, thus being among the oldest bumper manufacturers in the country.

Insurance Rates Cut for 4-Wheel Brakes

Cars Equipped with New System
Get Reduction from Na-
tional Liberty

NEW YORK, Aug. 6.—Cognizance of the four-wheel brake is taken by the National Liberty Insurance Co., which has sent out notices to its automobile agents that it will allow a reduction of 10 per cent in the collision rate and 5 per cent in the property damage rate on 1924 models equipped with four-wheel braking systems.

The announcement reads as follows:

Noting the rapidity with which the four-wheel brake system is coming into general use, and the inclination of several important automobile manufacturers to equip their new models with that system, the National Liberty, being convinced that it is the latest advance in engineering, believes that a reduction in collision and property damage premiums is merited.

Effective immediately, our automobile agents are hereby authorized to grant the following reductions from the regular manual rates: Collision, 10 per cent; property damage, 5 per cent.

The same collision and property damage clauses are to be used, no changes being necessary. The description of the car on the face of the policy will give us sufficient information as to whether the car is or is not equipped with the four-wheel brake system.

For your information 1924 models of the following makes have four-wheel brakes: Rickenbacker six-cylinder, Packard eight-cylinder, Buick four-cylinder, Buick six-cylinder and Duesenberg eight-cylinder.

Oil Companies Deny Plan to Shut Down Refineries

CHICAGO, Aug. 6.—Press dispatches from Kansas City state that the Western Petroleum Refiners' Association in conference there yesterday denied that the association's members will act in concert in closing down their refineries for the month of August. Members are urged individually to close down. After a conference in Chicago last week, the association issued a statement, saying that its members had decided to stop production of gasoline for one month in view of rapidly accumulating stocks. Following this action, representatives of the United States District Attorney's office in Chicago began an investigation to determine whether or not the association should be prosecuted under the Sherman Anti-Trust Act.

FORM OIL COMPANY

CHICAGO, Aug. 6.—The oil company organized by members of the Chicago Garage Owners' Association has been incorporated as the Garage Owners' Oil Co. Capitalization has been fixed at \$100,000 instead of \$50,000 as originally proposed. About \$25,000 of the capital has been paid in cash. The company is constructing a plant at Thirty-sixth Street and Western Avenue and expects to begin making deliveries of oil and gasoline shortly. Officers are: President, C. F. Burroughs; vice-president and general manager, George Kirk; treasurer, Robert Hoffman.

Boosts Philippines for Rubber Growing

Manila Executive Points Out Production Possibilities of Our Island Possessions

LOS ANGELES, Aug. 6—It is high time for the United States to insure the stability of her rubber manufacturing industries in which more than \$300,000,000 of American capital is invested, and this could be done by having rubber plantations under their own control, according to Fidel A. Reyes, director of the Bureau of Commerce and Industry, Manila, who writes to the Chamber of Commerce here in response to a request for an analysis of the possibilities for rubber growing in the islands.

"It is to be hoped that in the investigation authorized by the United States Congress to find new sources of rubber other than British colonies, the Philippine Islands will receive full consideration," says Reyes. "Half the rubber lands of Mindanao alone would be capable of producing a great portion, if not all, of the world's supply."

Continuing, Reyes said:

The production of para rubber in the Philippines has passed the experimental stage. According to records covering a period of several years kept by some of the local planters as to its growth under varying conditions, it was found that it makes a more sturdy growth in Mindanao and Basilan than elsewhere in the islands. In an average field of para rubber in Basilan, hundreds of trees about three years old showed a girth of 18 inches three feet above the ground. What is more interesting is that when several thousand trees four years old were tapped for the first time, the records of production for a period covering one year showed an average yield of one and one-half pound of rubber per tree. They proved to be prompt in bark renewals and wound response. The quality of the rubber being produced is pronounced to be A-1 and highly acceptable in the United States markets.

The para trees yield in Basilan as follows: Fifth year, 125 pounds per acre; sixth year, 175 pounds; seventh year, 235 pounds; eighth year, 300 pounds; ninth year, 350 pounds; tenth year, 425 pounds.

Opportunities Unexcelled

You find here in the islands all the qualities that make for a prosperous rubber-producing district. What is needed is an adequate supply of capital to make it so. But capitalists have been until now exceedingly slow in realizing the opportunities for investment in this region. Encouragements and assurances of full protection from the Philippine Government of all legitimate investments have not been lacking. Perhaps foreign investors have hesitated and still hesitate to come in for two main reasons, namely, the alleged insufficiency of the local labor supply and the limitations placed by the present land laws on the extent of public lands which may be acquired.

It is the consensus of opinion in the Philippines that the local supply of labor is far from being short as is contended, if only the laborers were well distributed throughout the archipelago. In fact, there are at present thousands of Filipino laborers in Hawaii

CONSTRUCTS PLANE TO CARRY 12 TONS

PARIS, Aug. 7—A giant commercial plane, to carry a load of twenty tons, is now under construction in the Farman factory near Paris and is expected to be out for trials at the end of the summer. Known as the Super-Goliath, the plant will be fitted with four Farman 450 hp. twelve-cylinder engines of the type recently subsidized by the French Government after a fifty-hour test. The general lines of construction are similar to that of the present two-engine Farman Goliath, used on the Paris-London and Paris-Brussels air lines.

who have played no small part in bringing that country to its present stage of agricultural development. Rather than import foreign labor, the Bureau of Labor is trying to shift this continued outward exodus of laborers to Philippine territory.

During the last session of the Philippine legislature serious attempts were made to amend the land laws with the view to further encouragement of the rubber industry. There was noted a desire to make it easier for American investors to acquire public lands in the islands for the cultivation of rubber and other plants. The bill presented to that effect, however, failed of passage pending developments which may turn up in the course of the investigation of the rubber possibilities in the Philippines. It is said that the bill will be reintroduced during the next session of the legislature, which will convene on Oct. 16 next, as a prominent administration measure.

Credit Concern's Report Shows Financing Success

NEW YORK, Aug. 6—The Commercial Credit Corp., formerly the Continental Guaranty Corp., which has made automobile paper a feature, has filed a financial statement as of June 30 which shows that motor lien retail time sales notes aggregated \$9,551,907, while motor lien storage notes and acceptances amounted to \$1,359,567. The appraised value of repossessed cars in the corporation's possession was \$5,548 and in dealers' possession and liability \$8,525, bearing out the statement that buyers of automobiles on time payments meet their obligations most satisfactorily.

Further proof of this is had in the statement that of the nearly \$10,000,000 in motor lien retail time sales notes only \$48,876 was over sixty days past due according to original terms, while on the motor lien storage notes and acceptances only \$7,624 was over two months past due.

The corporation has disposed of its British subsidiary to British interests and will confine its financing operations to the United States and Canada.

Jobbers to Listen to Strong Speakers

M. A. M. A. Selects Subjects for Discussion on Feature Night of Fall Convention

NEW YORK, Aug. 6—The program of the fall convention of the Motor and Accessory Manufacturers Association is rapidly rounding into shape under the direction of General Manager M. L. Heminway. A strong effort is being made to make the jobbers' session on Wednesday evening, Sept. 20, one of the outstanding features of this annual get-together of the parts makers.

With this idea in mind speakers selected for this session are specialists in their line. Ray W. Sherman, business counsel of the Class Journal Co., has been asked to talk on "Sales Promotion Through Jobbers." E. P. Chalfant, chairman of the board of the Gill Manufacturing Co., and also a director of the M. A. M. A., will tell "Why We Sell to Both Dealers and Jobbers." There is to be a third speaker, not yet selected, whose topic will be "Why We Sell Exclusively to Distributors." This, it is thought, will make a well-rounded out evening for the jobbers at which subjects of vital importance to them will be handled.

Citroen to Speak

Another speaker for the general session is to be S. S. Meyers, for fourteen years general counsel of the Motor and Accessory Manufacturers Association, to whom has been assigned the interesting subject: "How to Proceed in Bankruptcy and Receivership Cases." S. W. Dorman, vice-president and general manager of the Overseas Motor Service Corp., and chairman of the M. A. M. A. foreign trade committee, will speak on "How the Small Manufacturer Can Get Foreign Business."

Andre Citroen, the Henry Ford of France, who is expected to visit this country again in September, has been invited to speak, an invitation which will be accepted if Citroen's plans permit him being here at the time of the convention.

Instead of the usual banquet, F. T. Moore, chairman of the Boston committee, has arranged for a boat ride, shore dinner and dance at Nantasket Beach on Thursday evening.

Earl Motors Purchase Planned by Syndicate

CHICAGO, Aug. 7—That a deal is under way but not yet completed to purchase claims of creditors of Earl Motors by a syndicate of which he is the head, is admitted by A. B. Maccaughey. Briggs & Turivas, mentioned in the report as having brought about the consummation of the deal, are members of the Maccaughey syndicate. It is said that if the negotiations are successful the manufacture of the Earl car will be continued.

G. M. Sells 52,000 Vehicles in July

Figure Includes Cars and Trucks from American and Canadian Plants

NEW YORK, Aug. 6—Preliminary combined sales in July of the American and Canadian passenger and commercial car manufacturing divisions of General Motors totaled 52,000 cars and trucks; this compares with preceding months and further with corresponding months of a year ago as follows:

	NUMBER OF CARS AND TRUCKS SOLD	
	1923	1922
January	49,162	16,088
February	55,458	20,869
March	71,698	34,082
April	75,854	40,474
May	75,419	46,736
June	69,726	48,541
July	*52,000	33,772
August		42,840
September		35,443
October		40,815
November		50,222
December		46,871

*This preliminary figure of sales includes Buick, Cadillac, Chevrolet, Oakland, Oldsmobile, passenger and commercial cars and GMC trucks.

Orders State Warehouse to Sell Fuel at 16 Cents

PIERRE, S. D., Aug. 8—Governor McMaster has ordered the managers of the State warehouse at Mitchell to sell gasoline to the public at sixteen cents a gallon, characterizing the charge for gasoline in South Dakota as "highway robbery." The Governor declares that gasoline costs fourteen cents a gallon in this State and that the oil companies are selling it at twenty-eight. He advises the people to form associations to buy the product in carload lots until such time as dealers "cease their policy of greed and avarice."

Collins Demands O. K. of His Stockholders

(Continued from page 294)

duction the Collins six-cylinder car, in addition to the continued production of the Peerless eight-cylinder car, and this will permit the company to derive still greater advantages from its purchase of the assets of the Collins Motor Car Co., since the production of the Collins six-cylinder car will enable the company not only to strengthen its standing with its present exclusive dealers throughout the country, but also to add many others to its sales organization."

The committee of the directors that sent out the call for the stockholders' meeting is made up of George A. Coulton, C. E. Sullivan, Fred R. White, Victor W. Sincere and H. A. Tremaine, who are

among the wealthiest and best known business men in the city. They make a strong argument for the Collins administration in their letter.

They say in part:

We are of the opinion that the stockholders of the corporation for their own interest should express themselves as disapproving of these suits (the Rockwell suits). It is the opinion of the directors they were not brought in the best interests of the corporation; that their effect has been damaging, and that continuation of the litigation would be disastrous.

For many years Collins has been one of the outstanding automobile men of the country in the manufacture and distribution of high class motor cars. The Peerless Motor Car Co., was being operated in 1921 at a substantial loss, and the board of directors at that time thought it very desirable to obtain the services of Collins. Collins was with the company only the last three months of 1921 and his efforts materially assisted in reducing the loss for 1921.

We are advised by Ernst & Ernst, certified accountants, who are now completing the audit for the first six months of 1923, that during that period the company made more than \$200,000. When Collins first came to Cleveland, the stockholders were receiving dividends at the rate of \$2 per share per annum. This was increased in 1922 to \$3 and in 1923 to \$4. During this period more than \$2,000,000 of the corporation's ten-year convertible gold notes, which were secured by a mortgage and pledge of all this corporation's assets, have been cancelled and retired, either by conversion or by payment out of the earnings of this corporation.

The Peerless Motor Car Co., has no bank indebtedness, owes only current bills, not yet due, has more than \$1,000,000, on hand and owns free of encumbrance a splendid plant covering large acreage. The company has now on hand only sufficient stock of cars at its factory and eight branch houses to enable it to make prompt deliveries and it has fewer than 300 used cars.

The Collins contracts have been formally approved, the purchase contract is closed, the property has been received by the Peerless Motor Car Co. and used by it and we believe full value has been received by the company.

Ford Not to Close Plant or Bring Out New Model

DETROIT, Aug. 2—Reports that Ford Motor Co. would close for any period in August to re-equip its factory for a new model are denied by the company. Its schedule of over 180,000 cars and trucks for the month is pointed to as something that would make closing for any time out of the question as it must operate at better than 7,000 cars daily to equal this figure.

The bringing out of a new model in the usual conception of that term, meaning a rather complete changing of essential features of the present model, is not contemplated, it was declared, but it is not denied that refinements may be made in the present line. When these refinements are made they will be of a nature affecting principally radiator, and to some extent, body lines, but these changes will be made over night and will not subject the factory to important interruption of its regular production.

Gasoline Supplies Increase Over 1922

Heavy Consumption of Fuel Keeps Reserve Stocks from Mounting Higher

WASHINGTON, Aug. 8—Gasoline on hand at refineries July 1 amounted to 1,263,583,128 gal., constituting sixty days' supply at the June rate of consumption, according to figures compiled by the Department of the Interior, through the Bureau of Mines. The figure represents a substantial decrease in stocks from June 1, when sixty-five days' supply was reported. Supplies of gasoline available July 1 of last year were sufficient for forty-nine days' demand. Notwithstanding the existence of large gasoline stocks at this time, supplies are relatively only 22 per cent greater than on the same date in 1922, when the factor of greatly increased demand is considered.

Gasoline production in June was 636,734,217 gal. and was almost equal to the domestic demand, which amounted to 633,504,590 gal. Exports were 76,314,994 gal. Both the export and domestic demand for gasoline during June showed a substantial increase, the total being at the daily rate of 23,627,319 gal. The total demand exceeded the new supply by 64,950,119 gal., this amount being withdrawn from stocks. The new supply produced and imported in June this year was 22 per cent greater than for June last year, while the demand was 26 per cent greater.

Fewer Refineries Operating

A continued slight decrease in the number of operating refineries was noted in June, the number reporting to the Bureau of Mines for that month being 286. Their aggregate daily indicated crude oil capacity increased, however, to 2,045,547 barrels. This increase is due mostly to the installation of additional stills, which have just been reported to the bureau. These plants were operating during June at 77.9 per cent of their capacity, running to stills a daily average of 1,593,466 barrels.

G. M. DECLARES DIVIDEND

NEW YORK, Aug. 9—Directors of the General Motors Corp. today declared a quarterly dividend of 30 cents a share on the common, payable Sept. 12 to stock of record Aug. 20. They also declared \$1.75 a share on the 7 per cent debentures, \$1.50 on the 6 per cent debentures and \$1.50 on the 6 per cent preferred, payable Nov. 1 to stock of record Oct. 8.

OLDS ADDING TO EQUIPMENT

DETROIT, Aug. 7—Expansion of the Olds Motor Works production facilities will mean the installation of about 750 new machines and the addition of about 1000 more workmen, according to J. M. Scott, factory manager.

Control of Traffic Sought by New York

Grand Jurors' Association Makes Recommendations to Decrease Accidents on Streets

NEW YORK, Aug. 7—A thorough investigation of the traffic situation by a special committee appointed by the Grand Jurors' Association of New York City has resulted in the framing of fourteen recommendations to decrease automobile accidents in the metropolitan district. On this committee were Ralph Ebbert, executive secretary of the Brooklyn Motor Vehicle Dealers' Association, and Harry K. Maples, representing the American Automobile Association.

The taxicab operator comes in for the most attention in these recommendations. It is asked that he be compelled to take a rigid examination to determine mechanical ability, physical fitness and moral responsibility. If his license is revoked it should not be restored without conference with the magistrate who cancelled it. He also should be compelled to post a bond. Convictions also should be reported. The committee thinks, too, that the State law should be extended so as to compel all drivers in the State, owner as well as chauffeur, to take examinations and secure licenses.

The recommendations cited above are basic ones and in line with the belief of most law makers, but the committee branches out some from the conventional in demanding uniformity of motor ordinances and traffic signals; extension of the plan of street markings; continuation of the campaign to end jay-walking and an expansion of the city's playgrounds to keep children off the street.

Another idea to remove congestion from the streets is contained in a recommendation that the big business houses devise some method of loading and unloading of trucks within their premises.

BENFORD IN RECEIVERSHIP

NEW YORK, Aug. 7—Benford Auto Products, Inc., has been placed in a receivership, Charles C. Fenno being named as receiver by Judge Winslow. Liabilities are not stated and assets are placed at about \$10,000. The company is located at Mount Vernon, N. Y., and manufactures spark plugs.

ANOTHER BIG FORD WEEK

DETROIT, Aug. 8—The week ending Tuesday, Aug. 7, was the biggest in the production history of the Ford company, 293 more cars and trucks were produced than in the previous record week. The total domestic production for that week was 41,491 cars and trucks.

CHANGES 4-WHEEL BRAKE PLANS

DETROIT, Aug. 8—As a result of the announcement of the four-wheel brake model, the Rickenbacker Motor Co. has

received over 500 dealer inquiries, more than sixty of these being from large distributors. Because of this interest E. V. Rickenbacker announces that after Jan. 1 the Rickenbacker company will be 100 per cent on four-wheel brake production. It was originally planned to make 52 per cent of the production four-wheel brakes for the first ninety days as a test of the demand for this equipment.

Hyman Heads Stutz Sales; Progress Pleases Schwab

INDIANAPOLIS, Aug. 8—Herbert R. Hyman has been appointed sales manager of the Stutz Motor Car Co. of America, to fill the vacancy caused by the resignation of Fred Wilson. Hyman will continue in charge of advertising and production.

Stutz executives have been holding a conference this week, planning a sales campaign to be launched for fall and winter business, Eugene V. R. Thayer, chairman of the board of directors, being here for that purpose.

"Both Mr. Schwab and I are extremely well pleased with the progress made since we assumed control," said Thayer. "Under President Thompson's active management the business has progressed at a surprising rate. The company got into substantial production ninety days sooner than expected, while the dealer organization has trebled. I am thoroughly convinced that we will increase the records made in the first six months, due to the fact that Stutz now can supply closed cars, a thing that was possible only in a limited way in the past."

Court Places Bergougnan Rubber in Receivership

NEW YORK, Aug. 6—Charles E. Stokes, president of the New Jersey Rubber Manufacturers Association, and Gaston Tisne have been appointed equity receivers for the Bergougnan Rubber Corp. of Trenton by Federal Judge Runyon. The receivership is established, it is said, to enable the company to reorganize. The Societe Generale des Etablissements Bergougnan, a French concern, controls the American company, and the liabilities, which are placed at \$1,400,000, are said to be mostly owed to the French company. Of the liabilities \$400,000 is owed to a bank in this country, but these accounts have been guaranteed by the Credit Lyonnais of France. Assets are stated to be \$1,800,000. Judge Runyon has authorized the receivers to continue the business to Nov. 1.

The Trenton concern has been operating for a number of years and is quite well known in the American tire industry.

106,149 CARS IN SIX MONTHS

TOLEDO, Aug. 8—In the first six months of this year the Willys-Overland Co. produced 106,149 cars, beating the previous record of 93,435, made in 1916. The first half of 1922 produced 43,783.

June's Tire Output Shows Big Increase

Inventories Larger, While Decline in Shipments Is Noted in Monthly Report

NEW YORK, Aug. 8—Production of pneumatic casings, inner tubes and solid tires was greater in June than in May, according to a compilation prepared by the Rubber Association of America as follows:

PNEUMATIC CASINGS

	No. Mfrs. Report- ing	In- ventory	Pro- duction	Ship- ments
1922				
January	66	4,174,216	2,055,134	1,596,806
February	66	4,691,329	2,084,308	1,562,365
March	63	5,183,286	2,645,790	2,073,963
April	65	5,464,336	2,401,187	2,086,651
May	65	5,523,095	2,721,503	2,639,273
June	64	5,042,147	2,838,890	3,133,260
July	63	4,834,106	2,476,636	2,695,095
August	63	4,629,392	2,905,209	3,029,823
September	64	4,612,037	2,504,744	2,502,106
October	64	4,682,958	2,674,662	2,588,770
November	62	4,964,976	2,733,134	2,379,708
December	59	4,599,208	2,656,942	2,934,079
1923				
January	62	4,695,916	3,127,270	2,994,297
February	60	5,224,387	3,217,987	2,588,639
March	58	5,670,601	3,865,726	3,322,637
April	56	6,088,272	3,539,326	2,976,160
May	57	6,906,594	3,659,986	2,757,764
June	55	7,040,600	2,956,943	2,502,185

INNER TUBES

	No. Mfrs. Report- ing	In- ventory	Pro- duction	Ship- ments
1922				
January	66	5,246,647	2,343,393	1,890,724
February	65	6,141,956	2,596,774	1,702,583
March	63	6,991,118	3,017,511	2,090,737
April	65	7,230,096	2,650,573	2,329,343
May	65	7,189,552	2,970,696	2,938,947
June	64	6,186,534	3,130,629	3,973,679
July	63	5,675,839	3,068,199	3,630,744
August	63	5,207,228	3,808,224	4,220,055
September	64	5,164,757	3,501,442	3,558,971
October	64	5,488,033	3,787,758	3,420,680
November	61	6,210,053	3,850,908	3,075,023
December	59	5,732,125	3,411,074	3,825,949
1923				
January	62	5,838,310	3,951,885	3,748,651
February	60	6,771,958	4,039,202	3,001,697
March	57	7,740,945	4,875,414	3,828,315
April	55	8,394,184	4,259,558	3,535,635
May	57	9,292,223	4,317,537	3,414,115
June	54	8,924,326	3,590,011	3,581,060

SOLID TIRES

	No. Mfrs. Report- ing	In- ventory	Pro- duction	Ship- ments
1922				
January	11	181,769	40,224	33,294
February	11	183,448	39,492	36,805
March	11	182,197	49,433	48,350
April	11	173,748	46,664	52,309
May	11	170,904	57,640	60,711
June	11	169,808	66,089	63,408
July	11	176,375	71,505	60,425
August	11	189,698	84,313	69,435
September	11	200,016	82,767	66,797
October	11	213,942	85,480	71,275
November	11	234,684	85,775	61,466
December	10	244,061	77,221	64,576
1923				
January	11	262,462	83,343	60,611
February	11	270,191	75,457	63,394
March	11	265,843	79,788	77,144
April	10	260,631	71,468	72,609
May	10	268,323	77,288	67,147
June	10	283,425	72,445	52,125

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipment" includes only stock forwarded to a purchaser and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

Body Refinements Feature Nash Line

Victoria and Seven-Passenger
Sedan Are New Models—
No Price Change

KENOSHA, WIS., Aug. 8—A new line of Nash fours and sixes is now in production, incorporating a number of body refinements. There are thirteen body models in the new line, two of which, a Victoria and a seven-passenger sedan, are entirely new. Prices have not been changed, although the cars are more completely equipped and better finished. A Victoria has been added and is mounted on the 127-in. six-cylinder chassis. The new body has a tilted windshield and a sweeping square deck with a low built-in trunk. Aluminum bars are mounted on the top of the trunk as an embellishment, and also for permitting of the carrying of extra baggage. The Victoria is equipped with a rear vision mirror, vase, heater, silk curtains and a combination flush type vanity and smoking set. It is upholstered in taupe mohair and has a capacity of four adults with room for a child to sit behind the driver's seat. The auxiliary seat has been made broad and deep-cushioned, with an arm rest.

New Fender Contour

In addition to the special equipment mentioned on the Victoria, this car, as well as the other models in the six-cylinder line, is now equipped with the Folberth automatic windshield wiper, jeweled clock, new instrument board with all the instruments under glass, rubber filled running board and kick plates. One of the factors in the changed appearance of the Nash car this year is a new fender contour. The fenders are lower, more sweeping and deeper drawn. The front fenders have been extended forward and curve lower in front of the wheels. The apron starts at the very front of the fenders and curves forward to the extreme front end of the frame side members, more completely covering the front end than formerly. The rear fenders are extended farther back and down to enhance the appearance and give greater splash protection. The new six-cylinder sport model is finished in a sky blue, upholstered in gray Spanish leather and the new seven-passenger sedan has also been modified to a large extent, the rear seats being now made with spiral spring construction and deeper upholstery.

On the four-cylinder model the most conspicuous changes have been made in the Carriole. This is now finished in maroon with black running gear and fenders. Beading has been placed on the radiator shell and the steering wheel control mechanism has been replaced by the new, short lever type without the quadrant. Kick plates at the entrances to the body are now standard equipment. Mechanically the car remains practically

the same, except for a revision in the brakes, the former installation having now been replaced by a linkage similar to that used on the six. The equipment on Nash four-cylinder models has been improved to include cowl ventilators and all of them have the new type spark and throttle control. In the open models the doors now contain large pockets for storing the curtains. The curtains have been redesigned and are braced and held to form by metal bars, to avoid cracking the curtain lights. The curtains are more easily folded and are placed in the door adjacent to the point where they are attached to the top, avoiding the necessity for hunting for the proper curtain or searching for labels, in a sudden storm.

The bodies for the six-cylinder 121-in. wheelbase chassis are a five-passenger touring sport model, roadster, five-passenger sedan and four-door coupe. On the six-cylinder, 127-in. wheelbase chassis are fitted a seven-passenger sedan, Victoria, and seven-passenger touring body. The four-passenger line includes the Carriole, five-passenger sedan, sport model, roadster and five-passenger touring model, all on the 112-in. wheelbase.

Quality Engineer New Job Created by Packard Co.

DETROIT, Aug. 6—Packard Motor Car Co. has created the position of quality engineer as a special branch of its manufacturing division, to ward positively against the possibility of inferior material or workmanship entering into its product. Two men have been named to this position, R. M. Williams and J. H. Hammerl, who will operate as free lances in all departments, and reporting directly to E. F. Roberts, vice-president in charge of manufacturing.

The men named have each been in the employ of Packard upward of ten years in executive capacities, Williams more particularly in the chassis assembly plant and Hammerl in the body plant. In their new capacities each will confine his efforts to the plants in which they have become thoroughly experienced, and will have authority over all inspections. They will in addition make recommendations on factory practices, and will study these with a view to the possibility of incorporating recommendations advanced by the service engineering department.

REO CURTAILS VACATIONS

DETROIT, Aug. 6—Owing to extreme demand for cars, Reo Motor Car Co. is curtailing vacations in many departments of the plant to one week, and is issuing instructions to its men to report Monday. The entire plant was to have been closed until Aug. 13. The following departments are resuming Monday after a one-week lay-off: cylinder grinding, crank and cam shaft, heat treating, tool room, all men in tool cribs in all departments, front and rear axle machining and assembly, hub machining, grinding, gear cutting, automatic screw machine and all body paint departments.

Truck Owners Fight New Licensing Law

Claim Legislation Basing Annual
Fees on Weight Is Discriminatory

MILWAUKEE, WIS., Aug. 6—Motor truck owners of Wisconsin have started their fight to test the constitutionality of the new State license law basing annual fees on all motor vehicles by weight, which is claimed to be unjust and discriminatory, because it requires all trucks to be re-registered between July 1 and Aug. 1, this year, while in the case of passenger cars it will not be effective until Jan. 1, 1924.

Otto B. Thiel, president of the Wisconsin Motor Transport Association, submitted to arrest on July 27 on a warrant charging him with failure to comply with the new law, and when arraigned in the District Court at Milwaukee, the case was continued until Aug. 10. If found guilty and fined, Thiel will appeal to the Municipal Court, and unless a reversal occurs, will then appeal to the Supreme Court.

The new law gave truck owners thirty days after July 1 to re-register and pay the difference in fees between the amount paid when registering on Jan. 1, this year, and the weight schedules provided for in the new law. Some have done this, but the majority of truck owners are holding out on the claim of their association that the State cannot legally tax them twice.

Present License a Contract

"Truck owners already have contracted with the State and have been given permission by license to operate their vehicles during 1923," said Thiel. "We object to being forced to pay another registration fee during this period. Moreover, the new act requires truck owners to pay new fees on July 1, while passenger cars are allowed to operate under existing licenses until the end of the year. This obviously is discriminatory. The State is, in the first instance, violating its agreement with us truck owners; in the second place, it is exempting other users of the highways."

The fight is cementing motor truck owners together for mutual welfare and to combat inimical legislation in a way that perhaps no other contingency would do. It presages a concerted battle against the proposition to place a tax on gasoline, which was defeated by Governor's veto at the 1923 session of the Legislature but will be submitted to the 1925 session by its present proponents.

PAIGE INCREASES OUTPUT

DETROIT, Aug. 6—The Paige-Detroit Motor Car Co. has set a schedule of 5540 Paige and Jewett cars for production this month, the largest that the company has had this year, and an increase of almost 1000 over July.

Men of the Industry and What They Are Doing

Fenn Quits N. A. C. C.

F. W. Fenn, for five years secretary of the motor truck committee of the National Automobile Chamber of Commerce, has resigned to go into the truck business himself. He has allied himself with Service Motors, Inc., taking on the dealership in Rochester, N. Y., and also undertaking to organize the territory for the Service company. In this latter work he will have twenty-six counties, making his headquarters in Rochester. Fenn's long connection with the National Automobile Chamber of Commerce has made him thoroughly familiar with trucking problems as they exist today and in his new connection he will be able to put into practice valuable ideas along the lines of merchandising trucks.

Gardner Elects Directors

The quarterly meeting of the Gardner Motor Co., of St. Louis, was held in this city last week, the directors electing Russell E. Gardner, Sr., chairman of the board; Russell E. Gardner, Jr., president, and Fred W. Gardner vice-president. W. H. Yeldell, sales and advertising manager, was elected to the board. Returns on the first six months' business show earnings of approximately 6 per cent on the invested capital.

Coapman Leaves Russel Axle

John Coapman, manager of the Russel Motor Axle Co., has severed his connection with that concern after three and a half years' service. Coapman previously was chief engineer of the Denby Motor Truck Co., and for two and a half years was associated with Abner Doble in developing the Doble steamer.

Drumplemann Leaves Rickenbacker

W. J. Drumplemann has resigned as general sales manager of the Rickenbacker Motor Co. to take over the Rickenbacker agency in Cleveland. Associated with him is L. F. Johnston, who has resigned as assistant sales manager of the Rickenbacker company. Drumplemann and Johnston have formed the W. J. D. Motors, with a location at Thirtieth Street and Euclid Avenue, Cleveland, and will handle Northern Ohio territory. Since 1905 Drumplemann has been associated with Lozier, Oldsmobile, Chalmers, Hudson and Rickenbacker, while Johnston has been with Dodge, Chalmers, Elgin and Rickenbacker.

Loveless Joins John C. Hoof & Co.

W. P. Loveless has severed his connection with the W. R. Johnston Manufacturing Co., of Chicago, to become associated with John C. Hoof & Co. of Chicago, manufacturing a line of silent timing gears, intra valve tappets and other specialties. Loveless will have

charge of sales and advertising in the manufacturing division.

Webber Now With Bosch

Richard Webber, formerly with the old Bosch Magneto Co. and later with the Eiseman Magneto Corp., has associated himself with the Robert Bosch Magneto Co., Inc., New York City, as shop superintendent.

Schneider to Sell for C. G. Spring

Louis J. Schneider will sell bumpers to manufacturers in the Michigan territory as representative of the C. G. Spring Co. of Michigan. Schneider's previous connections were with the Clark Tractor Co., Harrison Radiator Co., and Hyatt Roller Bearing Co., in executive capacities.

Warns Against Exporting for Demonstration Purpose

WASHINGTON, Aug. 7.—A warning has been issued by the United States Bureau of Foreign and Domestic Commerce against American automobile manufacturers shipping goods for demonstration purposes to governmental agencies in foreign countries.

A better plan the department suggests is the appointment of a local representative, who in most instances is in a position to take over the consignment of shipments and thus obviate return of the goods. In a majority of instances cited to the bureau, companies who had shipped cars for demonstration purposes to representatives for foreign governments found that the bids were rejected, and they were put to considerable expense in returning the shipments.

Atlanta Bill Asks Higher Fuel Tax for State Funds

ATLANTA, GA., Aug. 7.—A bill has been introduced before the Georgia State Legislature, now in annual session in Atlanta, increasing the State tax on gasoline two cents per gallon, and imposing a five cent tax on motor oil. Such an increase would add about \$2,500,000 to the State revenue. The legislative committee of the Atlanta Automobile Association, with the cooperation of dealers throughout the State and operators of filling stations, is strongly opposing the proposed bill.

DURANT LETS BODY CONTRACT

DETROIT, Aug. 6.—Auto Body Co. has been awarded contracts for furnishing all open model bodies to be used in the manufacture of cars at the Durant plant in Lansing. The contracts are reported to mean the manufacture of about 150,000 bodies in the remainder of this year and through 1924.

Equipment Salesmen Start Service Study

Future Developments and Shop Machinery Discussed at Manufacturers' Conference

FRENCH LICK SPRINGS, IND., Aug. 6.—What is planned as a continuous study of service conditions was begun here at a meeting of 150 salesmen of fifteen automotive shop equipment manufacturers on the roster of the Service Equipment Associates. Three days have been devoted to present practices and probable developments in the maintenance shop in order that the men who sell equipment to the jobbers and act as special salesmen to the dealer might be better equipped to cope with the questions that come up in their work. They are being trained in such questions as garage finances as applied to overhead, possible time-saving equipment, how to charge by the job to cover the additional cost of equipment involved, and the part equipment has in bringing about improved conditions for the mechanic.

Salesmen Trained to Sell

It developed that a fairly complete line of shop equipment is manufactured by the membership of the association and the salesmen of the members are being trained to talk on behalf of the products of the members along the idea of the Rotary Club. Two business sessions were held each day and the afternoon devoted to sport. The general opinion was expressed that a jobber cannot successfully or profitably sell equipment unless he establishes an equipment department and employs a salesman or manager for this department who understands the uses of the equipment. Those present pledged their best efforts to the work of educating shopmen to an understanding of the new problems that are involved in making maintenance pay with equipment, and for a better understanding of the wide variety to which much of the equipment often sold as single purpose machinery can be put.

Tribute to Harding

Upon receipt of the news of the death of President Harding a tribute was paid in silent salute and a prayer by a member of the conference. The singing that featured other sessions was eliminated. Representatives of the following firms were present:

T. R. Almond Mfg. Co., Black & Decker Mfg. Co., Brunner Mfg. Co., Burton-Rogers Co., Continental Auto Parts Co., Jacobs Mfg. Co., Kellogg Mfg. Co., Manley Mfg. Co., Midwest Mfg. Co., Frank Mossberg Co., Stevens & Co., Van Norman Machine Tool Co., Weaver Mfg. Co., Weidenhoff Products, Inc., Wright Mfg. Co.

Xmas Sales Campaign Approved by A. E. A.

Merchandising Committee Makes Early Start to Line up the Trade

CHICAGO, Aug. 6—A comprehensive Christmas sales program, including a number of features of cooperation with dealers, was approved this week by the Merchandising Committee of the Automotive Equipment Association, and Arthur R. Mogge was authorized as merchandising director to proceed immediately to put it into effect.

Activities are being started thus early in order that manufacturers, jobbers and dealers may provide themselves with proper stocks and make preparations to participate in a general cumulative retail selling campaign that will be based on the idea of inducing people to give automobile accessories, parts, equipment, service or supplies as Christmas gifts.

A slogan for the Christmas sales campaign was adopted. It is:

Something for the Car for Christmas

An effort will be made to have manufacturers, jobbers and dealers use this slogan freely in their Christmas advertising. It will be printed on a window streamer 9 by 48 inches, copies of which may be procured by dealers from their jobbers.

FORD THREATENS INJUNCTION

DETROIT, Aug. 8—An injunction restraining the city from placing an order with the Cadillac Motor Car Co. for six cars and one chassis to be used as police fliers will be asked by Edsel Ford, who claims that inasmuch as the Lincoln won

the speed tests conducted by the city and the specifications said that the result would be taken into consideration in awarding the contract, that it should have been selected. Ford is credited with having intimated that the Ford Motor Co. is not likely to be interested in further financing of the city, to which Henry Ford has loaned \$3,000,000, because of this mixup. "It is not a matter of needing the business, but of principle," Edsel Ford states.

N. Y. Show Manager Proves Accessibility of Armory

NEW YORK, Aug. 7—The first gun in the campaign to demonstrate to the industry the accessibility of the Eighth Coast Armory, which will house the next New York national show, has been fired by Samuel A. Miles, manager of the show. The broadside takes the form of a huge poster in black and red, carrying a map which shows how easily the Armory, at 196th Street and Jerome Avenue, may be reached from any point of the compass by New Yorkers and commuters.

Arguments favorable to the location are advanced as follows:

A majority of the residents of Manhattan and all of the residents of the Bronx live nearer to the Armory than to any other exhibition building. The half-million or more residents of Westchester County—Yonkers, White Plains, New Rochelle, Pelham and a score or more of smaller towns—are about ten miles nearer the Armory than any other exhibition building. There are, within four miles of the Armory, 1,367,000 people, and within six and one-half miles 1,892,000 people. There are half-a-million people between 110th Street and Spuyten Duyvil, on the west side. Yonkers, reached in thirty minutes, has 100,000 residents. Mount Vernon, White Plains, New Rochelle, Rye, Pelham and other suburbs have at least 300,000 more. The Polo Grounds and the Yankee Stadium, which hundreds of thousands of people will visit this summer, are within six minutes' taxicab ride and twelve minutes by subway or elevated from the Armory.

Locomobile Plant to Build Princeton

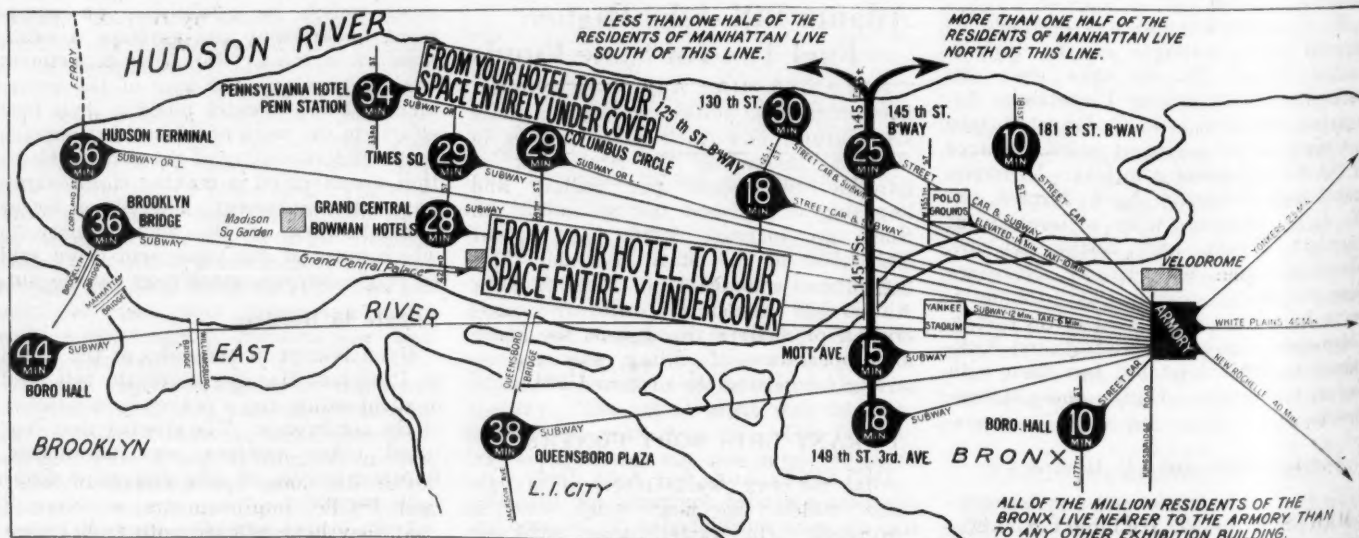
Durant Puts Manufacture of New Line Into E. B. Jackson's Hands at Bridgeport

BRIDGEPORT, CONN., Aug. 8—The Princeton car, announced at show time by Durant Motors, Inc., and which was to have been built at Muncie, Ind., will be manufactured at the Locomobile plant in this city. The car will be in production next spring. It is being planned to turn out 1500 the first year, 3000 the next, and so on until the 5000 per annum mark is reached. Production of the Locomobile will continue at the same plant on a basis of two cars a day.

This statement of future plans is made by Edwin B. Jackson, vice-president and general manager of the Locomobile Co. of America, in assuming his duties as successor to Colonel Elmer E. Havens of this city, resigned.

Jackson states that the present factory space, with the present Locomobile production set at approximately 600 cars annually, is sufficient to permit building of the Princeton along lines planned. He thinks, though, that it will be necessary to erect some new factory buildings, but definite decision as to this detail is held in abeyance, pending consummation of final plans.

"The Princeton now is what is known as an assembled car," Jackson says. "It will be built here in its complete form, with the exception of the bodies. It is a six-cylinder, ranking next to the Locomobile in price and quality in the Durant products. Building of the Princeton will complete the definite picture that W. C. Durant had in mind when he organized Durant Motors, Inc. The products cover a range from the low-priced, the Star, up to the Locomobile."



To demonstrate the accessibility of the Eighth Coast Armory, where the next New York national automobile show will be held, the National Automobile Chamber of Commerce has prepared the map of New York City shown above. Subway service is so good that it is possible to go from the Battery to the Armory at 196th Street and Jerome Avenue in forty-four minutes, while it is less than a half-hour's ride from the Forty-second Street district

Jewett Brings Out Special Roadster

Three Models Dropped From Line—No Change Made in Prices

DETROIT, Aug. 6—Simultaneously with the elimination from their line of the standard three-passenger roadster, the standard four-passenger coupé and the special four-passenger coupé, Jewett Motors has announced a new special three-passenger roadster. The new special roadster, which is priced at \$1,195, is equipped regularly with spring bar bumpers, front and rear; motometer, nickel headlamps, drum side lights on the cowl, combination tail and stop light, sun visor, and an automatic windshield cleaner. An extra cord tire with tube and cover is also included in the standard equipment. A nickel radiator and a blue finish will identify this roadster.

At the same time several mechanical refinements are going into production on all models. Rear brake drums have been increased to 14 in. diameter and heavier, stronger wheels with larger spokes and two additional detachable rim bolts, making six in all, are fitted all around. Lubrication of the valve pushrods has been improved by the addition of an oil collector ring at the top of the push rod guide. Some changes have been made on the carburetor.

Prices Remain Unchanged

The instruments have been assembled in a raised oval panel at the center of the instrument board. The gearshift lever has been inclined toward the driver's seat, and new spark and throttle levers of improved appearance have taken the place of the former quadrant assembly on the steering column. Deeper upholstery is found in all the open models, and the back angle of the front seat has been improved. Flatlite reflectors with plane lenses have been placed in the headlamps.

The Jewett line now includes five body types on the standard chassis. No change has been made in prices.

With the exception of the new roadster, the special models are all standard equipped with an extra cord tire, complete with tube and cover, trunk rack and trunk, combination tail and spot light, spring bar bumpers, front and rear. Also included as standard equipment are a motometer, drum type cowl sidelights, and nickel headlamps, automatic windshield wiper, rear view mirror and sun visor. The closed models are equipped with heaters. Disc steel wheels are optional on all models at an extra charge of \$25.

MAKES RECORD DETROIT SALES

DETROIT, Aug. 6—The Studebaker Detroit branch has in the first seven months of the present year sold and delivered 2434 new cars and 2784 used

cars, surpassing the sales in both classes for the entire year 1922, which showed 2368 new and 2763 used cars. In 1922 Branch Manager E. B. Wilson said sales had trebled the best previous year. Fall business is expected to be as much a record breaker as that of the early part of the year, Wilson said, and closed car demand will exceed factory production in the leading lines. August has started off with such good business, he said, that there would probably be little evidence of the expected breathing spell.

Willys' Half-Year Shows Big Earnings

(Continued from page 295)

ity for production of Willys-Knight cars by 50 per cent for the coming year.

The condensed balance sheet lists the permanent assets of the company at \$26,702,898 after an allowance of \$14,150,856 for depreciation and loss. Good will is listed at \$1. There remain unpaid dividends on the \$22,049,500 of outstanding preferred stock amounting to a total of \$4,244,528 as of June 30, 1923.

The estimated deficit in the balance sheet is placed at \$35,306,592, leaving a surplus of assets over liabilities applicable to common stock amounting to \$18,687,332 considering the stock outstanding at par in the balance sheet. The balance sheet is as follows:

ASSETS		
	June 30, 1923	Dec. 31, 1922
Property account.....	\$26,702,899	\$29,509,327
Good-will, patents, &c.....	1	1
Investments	1,230,072	1,314,976
Inventories	26,430,165	24,171,209
Notes and accounts receivable	385,474	284,995
Trust fund	264,253	47,770
Notes and accounts receivable	4,344,583	2,798,948
Cash	7,248,321	272,054
Deferred charges	149,963	238,420
Total	\$66,755,731	\$58,637,700
LIABILITIES		
Preferred stock.....	\$22,049,500	\$22,049,500
Common stock.....	53,993,925	10,768,307
Preferred stock of subsidiary companies.....	219,400	219,400
Gold notes.....	16,943,000	15,968,900
Stock purchase contract	1,069,380	1,069,380
Notes payable.....	825,000	825,000
Accounts payable.....	10,859,259	2,233,748
Other liabilities.....	8,874	422,070
Accrued taxes and Int.	431,323	1,261,049
Res. for contingencies.....	3,604,414	3,611,786
Inventory reserves.....	2,883,249	1,209,560
Deficit (estimated).....	\$35,306,593	
Total	\$66,755,731	\$58,637,700

*This deficit is a charge against the common stock, and in consequence the common stock is carried on the books at \$18,687,332. †Coincident with the issue of this statement, the entire remaining balance of \$6,943,000 was authorized to be paid, leaving the company without bank indebtedness.

General Motors Licensed to Use Swan Manifolding

CLEVELAND, Aug. 8—Announcement is made by the Swan Carburetor Co. that it has licensed the General Motors Corp. to use the Swan system of manifolding, with which the new Buick line is equipped. The system was developed by J. W. Swan, who formerly was research engineer for the Standard Oil Co., collaborating with C. A. Kirkham, chief engineer of the Swan company.

Buses Prove Utility in Trolley Strike

New Jersey Residents Feel Little Effects With Motor Transportation

NEW YORK, Aug. 6—The New Jersey trolley strike is giving the automobile one of the best opportunities it ever has had to demonstrate its utility. Regardless of whether or not the 6500 strikers win their point and secure an increase in pay, the fact remains that in this big emergency the motor bus and the humble jitney have more than made good.

With every trolley idle, automobile transportation has been called upon to carry the New Jersey people to and from their work. Anticipating the strike, all plans had been made in advance, so that when the tie-up came there were big fleets of buses and jitneys ready to serve the big population of New Jersey, which has been dependent upon the trolley for transportation. So far there hasn't been a complaint. Possibly there are not enough buses to meet all needs, but the business world across the Hudson is not feeling the effects of the strike as it used to, in the days when automobiles were not so numerous.

Bus Transportation Liked

As a matter of fact, the people seem to like automobile transportation better than the trolleys. With the mobility of the automobile, more frequent service can be had, and the buses make as good time as the trolleys used to. It looks now as if they will be the most effective weapon in bringing about peace between the warring trolley men and the company, and it may be after the smoke of battle clears away that bus lines will spread across New Jersey in greater numbers than before and become serious rivals to the trolley.

The trolley company realizes this and already has accused the buses and jitneys of cutting into its receipts to so great an extent that it has been impossible to earn money enough to pay dividends.

This whole section has been well supplied with bus service for several years with five-cent rates prevailing as compared with eight cents on the trolley lines. The bus service is well organized, and all that was necessary to meet the strike emergency was to bring in a few hundred extra vehicles from New York and Connecticut and get temporary passenger-carrying privileges for private automobiles.

So well satisfied with the bus service are the Board of Public Utility and Director Raymond, Commissioner of Street and Public Improvements of Newark, that they have notified both trolley company and strikers that unless the strike is ended soon they will place buses on a permanent basis by issuing long-term permits to the bus owners.

SALES HOLDING UP IN MIDDLE WEST

Chicago

CHICAGO, Aug. 6—Retail sales of automobiles have continued unusually good in this territory throughout July as compared with the corresponding period in former years. The decline in sales has not been as great as was expected at the beginning of the month. Many dealers have fewer used cars on hand than at any time this year, and this is partly due to the fact that the prices of used cars have been hammered down to a very low point. There is, of course, the usual hesitation on the part of many prospective buyers to make purchases just at this time when new models are coming out. Nevertheless, the trade has continued to go on at a highly satisfactory rate.

Crop conditions continue good throughout this territory, and farmers are looked upon as potential buyers for the fall market. General business conditions are good, with the result that truck sales have continued at a good rate.

Cincinnati

CINCINNATI, Aug. 6—The falling-off in retail automobile sales usually experienced during July and August failed to materialize to any great extent in the Cincinnati district this year. The sale of both new and used cars in all models and price ranges has been very good for the past thirty days, with every indication pointing to an increase in volume in the immediate future.

In the used car market, both the number of cars sold and the prices obtained have been satisfactory. In the new car field the demand for closed models, while not equal to that for roadsters and tourings, is active.

Farmers in this vicinity, it is reported generally, are not buying in proportion to the city people. Collections are rather slow.

Detroit

DETROIT, Aug. 6—The retail situation in Detroit is continuing very satisfactory, and dealers look for no letting-up in business inside the next two months. Dealers continue to have great difficulty in getting deliveries of closed cars in the standard lines, and demand also is considerably ahead of deliveries in sport open models. In the regular run of open models, deliveries are more equal, but in most cases there are delays of from a week to ten days between orders and delivery. There is no stocking of cars in this city.

Used cars have been moving in much the same ratio as new cars in the city, but there is some stagnation in the used vehicles in the smaller industrial cities of the State. Dealers in these cities are making vigorous drives on their used

stocks and will continue these throughout August, so as to be in good shape for the opening of fall business. Farm business is being specially driven for at this time in the State territories, because of the promise of good markets for the variegated crops.

Distributors foresee a good late summer and fall business in this territory, but do not expect it to be as large as the business in the early part of the year. Some shifting about is expected following the announcement of new models by leading companies, but the general effect of the new models is expected to be stimulating.

Columbus

COLUMBUS, OHIO, Aug. 6—Just when the farmer was getting in the market for passenger cars, the slump in wheat came, and this had a bad effect on the trade in rural sections. The drop was not so pronounced, however, and there still is considerable business being booked among the agricultural population. City business is holding up well for the time of the year, although the volume of business toward the latter part of July and early in August was not as heavy as in the previous month. Used cars are becoming a drug on the market.

General business conditions for the sale of new cars appear to be good, as workers are busy at good wages and there is practically no unemployment. Cars priced from \$600 to \$1,200 find the best sale at this time, although cars up to \$2,000 and \$2,500 are being sold in large numbers. Closed jobs are still increasing in popularity.

Buffalo

BUFFALO, Aug. 6—This city has been feeling the seasonal decline in automobile merchandising, but it has not been heavy enough to be termed a slump. During the last two weeks in July business spurted up, not to any remarkable degree, but enough to be noticed and to cause comment.

Heavy used cars are moving readily. The demand for light used cars is regarded as about normal.

The demand for new closed cars is about 75 per cent, as compared with 25 per cent for open models. Dealers here are able to make deliveries on about 65 per cent of the new closed cars sold.

Farmers are buying cars. According to Executive Secretary Carlton C. Proctor of the local automobile dealers' association, reports received from dealers in the country commonly described as Buffalo's territory show that business is good. It is expected this rural demand will be stimulated by automobile exhibitions at county fairs.

Milwaukee

MILWAUKEE, Aug. 6—A conspicuous feature of the current demand for passenger cars is the steady manner in which farmers in Wisconsin are buying. This State occupies a rather unique position. While many other middle western and northwestern States are sorely depressed by the wheat price situation, the farmers of the Badger State are in relatively much better shape, for dairy products are commanding respectable prices. The main grain crop is oats, which holds to a fairly normal level. Corn, which is second, is presently commanding high premiums over all other grains. Barley, the third crop, is enjoying a good price situation. Wisconsin farmers are sympathetic with the somewhat unfortunate state of affairs of their brethren in neighboring one-crop States, yet they are able to buy cars and showing a disposition to buy.

City sales during July naturally showed a decline from the previous months, but dealers in 75 per cent of cases were still behind on deliveries of closed types on Aug. 1. Open cars were generally in fair supply for quick delivery, although a few dealers, representing the most popular makes, said they were not always able to give purchasers their cars on the same day.

Undoubtedly interest in passenger cars has been markedly quickened by the Aug. 1 announcement of new models.

Minneapolis

Outlook for sales of automobiles in Twin City territory is excellent. The slack season is still manifest in the cities, but renewed interest is shown in the country. Where hitherto arid areas have had rains, business in cars is better. Notwithstanding some bad harvest weather and signs of rust and low prices for farm products, automobiles are selling well. Farmers are buying commercial cars that can be utilized for passenger travel to and from the farms. Where roads are being made better the closed car is growing in favor. In North Dakota closed cars are in favor, but as a rule in Montana, dealers report the open car still the favorite. Prospects for late fall business are predicted for 25 to 50 per cent better trade than last year. Some of the large medium price distributors report business for the first six months 50 per cent improvement over 1922. The average for the year promises to be above 25 per cent higher than a year ago. South Dakota business is good, North Dakota is improving. Montana is in better condition and Minnesota has a good run on cars. Dealers are changing over to the sight draft plan of payment, from the acceptance plan, distributors report for some parts of the territory, which is regarded a good sign.

GOOD REPORTS FROM OTHER CENTERS

Indianapolis

INDIANAPOLIS, Aug. 6—July car sales for Indianapolis were within ten points of June sales and deliveries. Advance registration figures for the county in which the city is situated showed a falling-off of about 8 per cent. In spite of this, a rather spotty sales condition existed, with some dealers suffering for lack of cars because of model changes and other reasons. Others with popular lines fell off more than the average, while some lines with improved deliveries made better records than before this year. Used cars as a whole fell off more than new car sales, and closed cars ran about as usual, with two closed jobs for every three open cars. Reports from the State indicate better sales than had been anticipated, with probably less than 12 per cent decrease under June figures. Probably the greatest single factor in the fine July business and the increased deliveries to this territory from the local Ford assembly plant.

Louisville

LOUISVILLE, KY., Aug. 6—Local sales of new automobiles for the month of July show a decline of 10 per cent as compared with June sales. This is a smaller percentage of decline than the record of June as compared to May, which was 12 per cent. It is noticeable that closed cars in the medium price class and in Fords are holding their own against the record of the preceding two months.

	OPEN		CLOSED		TOTALS	
	June	July	June	July	June	July
High Priced	14	9	8	6	22	15
Medium	138	131	92	94	230	225
Low	148	140	82	69	230	209
Fords	346	277	199	203	545	480
Totals	646	557	381	372	1027	929

The used car market is fair and business is good in the country territory.

Kansas City

KANSAS CITY, MO., Aug. 6—Slackening in car sales was noted during July, and the present prospect is that volume may not increase radically for a month or so. The agricultural situation is the cue. Farmers are receiving so low a price for wheat that even when a good crop is secured a farmer is said to be unable to find enough revenue from it for all his necessities. Wheat will dominate the economic situation until fall, the low net revenue of farmers reacting against small-town merchandising and affecting the distributing centers and the larger cities promptly. The good price for corn and some live stock will serve to restore balance later.

Automobile distributors and retailers have this fall discerned as never before

the practical application to them of the program of the Good Roads Association of Greater Kansas City. This program is based largely on promotion of diversified farming, the development of dairying, especially, so that there will be more farmers per square mile and a larger proportion of farmers who have steady, reliable incomes. The heavy wheat crop this year that is said, by extremists, to be a liability to the growers, since it costs more to harvest and market than they will get out of it, suggests the value to a community of other crops when they can well be raised.

Des Moines

It is difficult to get an accurate measure of actual business conditions in this field just at the present time by reason of a difficulty in sifting the heavy interest stimulated within the past two weeks by factory announcements as to new models. As a matter of fact registration in Polk County of which Des Moines is the county seat was heavier in July than during June. There is apparently a fairly good outlook for August prospects. The farmer demand is fairly brisk and has temporarily at least forced open car demand ahead of closed car. Local distributors are looking for the open models to have selling advantages during the next sixty to ninety days. The wheat price which has been used by some propagandists to stir up the farmer is having little effect in Iowa as Iowa farmers raise very little wheat and no less a personage than E. T. Meredith, former secretary of Agriculture has publicly belittled the statements as to the depressing effects of the wheat price upon the Iowa farmer. There is a good demand for standard used cars and a majority of the local dealers say this class of business is in good shape.

Atlanta

ATLANTA, GA., Aug. 6—Atlanta dealers and distributors advise that automobile sales the past month experienced hardly any decline as compared with June, and in many cases dealers report an increase in volume, especially those handling cars on which the new 1924 models have been announced. As a whole the situation in this district, dealers state, is eminently satisfactory, with every indication now that 1923 will prove the best year the industry has ever enjoyed in the Southeast.

The principal demand continues for lower and medium-priced cars, though higher-priced makes are also in good demand. July business as a whole appears to have been 20 to 25 per cent better than July last year, and with some dealers 35 to 40 per cent better. Truck sales are the biggest they have been in this section for many months.

Dallas

DALLAS, TEX., Aug. 6—While there was a slowing up in the retail sales of automobiles in the Dallas district in July, it was not as perceptible as in other sections, according to dealers. Something like 1000 new cars were disposed of by the Dallas retailers during the month, and some reported demands so great that they could not be supplied. There is plenty of money in the country, and the cotton crop, estimated at more than 4,000,000 bales, valued at around \$500,000,000, is beginning to reach the market. Dealers declare this will mean more sales for the remainder of the year than have been made in the past.

The demand for closed cars appears increasing, especially in the cities and larger towns.

The rural districts are buying quite a few cars now, and dealers expect a bumper trade with the farmers for the remainder of the year.

The used car continues to be a problem with the dealers.

Omaha

OMAHA, Aug. 6—There is a slight slump in sales at this point, but sales managers are not worried. Sales are running along at a fair rate with closed cars ahead of open. Farmers in this territory are fairly supplied with cars. Those who have marketed their small grain are buying tractors for fall plowing rather than passenger cars. Used cars are going fast for dealers who guarantee their overhauling work. Non-guaranteed sales are slow in this city. All counties of Nebraska are preparing to run auto and tractor shows with their annual fairs which start soon.

Pittsburgh

PITTSBURGH, Aug. 6—The seasonal slack in the retail field is on at its fullest, but a survey indicates the dealers are in an optimistic frame of mind. The outlook for fall is particularly good. The falling-off in trade is larger than ever before in actual number of cars, but it is pointed out that the sale this year has been exceedingly heavy.

There is excellent inquiry for new models, and especially in higher-priced cars a promising business is in the offing.

The past four weeks have seen a considerable number of used cars moved from the dealers' floors. Dealers, therefore, are in an excellent position, and all evidence points the reason to be a greater effort to sell used cars and the fact that the dealers are not so liberal in their trade propositions.

Dealers expect closed cars to take a greater percentage of their sales from now on. But, they point out, the open car still has many favorites.

Ford Foreign Sales Show Big Increase

Evidence Improved Economic Conditions in the Smaller European Countries

DETROIT, Aug. 2—Notable features, indicating more stable conditions in smaller European countries, are shown by Ford foreign sales, which for the first six months of the present year exceeded by nearly 100 per cent those of the same period last year. Syria is showing a predominance of Ford sales, the company reports; improved exchange in Greece is materially aiding business, and a growing demand in Jugo-Slavia and Czecho-Slovakia is becoming manifest.

The British Isles, Scandinavian countries and the Argentine, in the order named, gave the largest volume in the total export business, while the greatest increases during the first half of the year were in Scandinavia and the Argentine. Notable, too, is the great improvement in business conditions and consequent automobile sales in Australia, New Zealand and South Africa.

Ford Motor Co. of Canada, Ltd., in its report for the year ending July 31, shows a total output of 70,328, as compared with 45,000 in the year previous, a gain of 60 per cent. Of this total 39,923 were sold in the Canadian market, and 30,405 in the export territory served by this company. Exports last year were 12,112. The Canadian Ford export territory includes all British colonies and possessions outside of the British Isles.

A comparative table of total Ford export business by both the United States and Canadian companies for the first six month period of the present and past two years shows:

	cars *tractors	
1923	95,087	5,034
1922	48,707	2,348
1921	26,368	723

*Tractors are made in the United States and at Cork, Ireland.

Claim Dealers Charging Car Buyers Unlawfully

LOS ANGELES, CAL., Aug. 8—The office of the Attorney General has directed attention to the fact that some automotive dealers are charging purchasers on the time payment plan confiscation insurance and are not taking out policies with insurance companies, but are keeping the premium. Dealers have been advised that the Attorney General intends to take drastic action in this matter.

Dealers are advised they have no right to represent to customers that they are paying for confiscation insurance unless the policy is actually taken out. Dealers are warned also that they have no right to carry the insurance unless they meet all the requirements of the State's insurance laws.

The question of "conditioning charges"

is said to be receiving the attention of authorities. It has long been the practice of dealers to include this "conditioning charge" in retail prices. This is in addition to the freight and war tax. Dealers seek to justify the charge because of the expense to which they are put in bringing the cars from the docks and getting them ready for delivery.

From the standpoint of the dealers the charge is regarded as absolutely fair, but buyers have begun to ask why this should not be a part of the regular cost of doing business without their having to pay for it. The claim is advanced that the expense is one that should be adjusted between the dealers and their factories and not passed on to customers.

FINANCIAL NOTES

Mack Trucks, Inc., for the six months ended June 30 earned \$4,044,476, compared with \$1,578,307 in the corresponding period of 1922. After preferred dividends the surplus was equivalent to \$13.23 a share on the common, against only \$3.53 a share earned in the first six months last year. For the three months ended June 30 net earnings were \$2,529,544, after charges, depreciation and Federal taxes. Net earnings for the corresponding period last year totaled \$1,315,634.

Spicer Manufacturing Co. has issued a preliminary statement for the first six months, showing net profits of \$1,030,962, after expenses and interest, equivalent after preferred dividends and estimated Federal taxes, to \$2.49 a share on the 313,750 shares of no par common. This profit compares with \$685,002 for the corresponding period of 1922, or \$1.52 a share on the common. Total income for the first half of this year was \$1,199,430, as compared with \$861,192.

Mullins Body Corp. reports sales for the first six months of \$1,828,092, with operating profits of \$16,341 and net profits of \$100,786. The earnings on common, stock amounted to 61 cents per share.

The Wheeler-Schebler Carburetor Co. of Indianapolis has opened a Cleveland office and placed in charge C. K. Alexander, who has been with the company for the past twelve years.

Borg & Beck Co. reports a net income of \$321,144, after all charges, for the first half. After dividends, \$171,144 was added to surplus, making the total profit and loss surplus \$926,819.

Electric Auto-Lite Co. of Toledo reports net earnings of \$361,925 for June, after interest and other charges, the largest total reported for any month thus far this year.

Maxwell Motor Co. for the six months ended June 30 reports net profits of \$3,072,532 after taxes, insurance, depreciation and other charges.

MAY CHANGE HIGHWAY NAME

AURORA, ILL., Aug. 7—It is proposed to change the name of the Cannonball Trail to the Harding Highway, and action will be taken at a meeting of the association, which will be held soon. Behind the suggestion is the thought that the late President Harding was nominated for the presidency in Chicago, the Eastern terminus of the route, and died in California, where the highway ends.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

The general situation shows little change, hesitancy remaining the dominant feature in most domestic markets.

The Government forecast of the cotton crop on Aug. 1 estimated the year's output at 11,516,000 bales, and the condition at 67.2 per cent. This report was considerably less favorable than had been anticipated, and caused a sharp rise in prices which has been largely maintained.

The average daily pig iron output in July was 118,703 tons. This compares with 122,250 tons a day in June—a decline of 3 per cent. The rate of production on Aug. 1 was estimated at 42,000,000 tons yearly, or 9 per cent below the rate on June 1, which was the highest figure reached. Active blast furnaces declined 25 per cent in July.

Car loadings for the week ended July 21 numbered 1,028,927, a new high record.

Further curtailment of production by cotton mills is reported, accompanied by price reductions in certain lines.

The production of crude petroleum set a new record during the week ended July 29, with a daily average of 2,274,000 barrels, as against 2,256,000 the previous week and 1,500,000 a year ago.

Following a decline of 1 per cent in Dun's index of wholesale prices during July and 2 per cent in Bradstreet's index, Professor Irving Fisher's index for the week ended Aug. 4 declined one point to 153, cancelling the one-point gain recorded the previous week.

The sales of leading mail order houses in July showed a seasonal decline of 10 per cent from June. The July figure, however, was 29 per cent above a year ago.

Bank clearings in leading cities during the week ended Aug. 2 showed a gain of 7 per cent from the preceding week, but a decrease of 6 per cent from the corresponding week last year. The clearings outside of New York were 1 per cent less than the preceding week and 8 per cent more than last year.

Discounts of the Federal Reserve banks increased \$45,900,000 during the week ended Aug. 1. Deposits increased \$48,000,000, of which \$40,200,000 was accounted for by the gain in member banks' reserves. Federal Reserve notes in circulation declined \$7,100,000 and reserves \$6,300,000. The reserve ratio dropped from 78.2 to 77.3 per cent.

Loans of reporting member banks declined \$47,000,000 in the week ended July 25, while investments declined \$15,000,000, reserve balances with Federal Reserve banks \$43,000,000, demand deposits \$85,000,000, and accommodation at the Federal Reserve banks \$55,000,000.

Call loans, after rising to 6 per cent early in the week, dropped as low as 4 per cent, but in general ranged around 5. Time loans remained at 5 to 5½ per cent.

More Than Million See New Buick Line

Company Counts Number of Persons Who Inspect 1924 Models in Four Days

DETROIT, Aug. 8—More orders are on hand than ever before in the history of the Buick Motor Co. as a result of a showing of the new models, according to E. T. Strong, sales manager. Strong states that as a result of mechanical counting in large centers and estimates in smaller centers, more than 1,000,000 people saw the new Buick models between Aug. 1 and Aug. 4. By mechanical count 52,710 saw the cars in New York City; 27,366 in Minneapolis; 24,240 in Chicago; 19,600 in San Francisco, and sixteen other large centers averaged 9388.

Estimates at Boston, St. Louis, Cleveland, Los Angeles and Cincinnati showed an average attendance of 25,000 at each of these points. Portland, Denver and Washington averaged 18,000 apiece. Thirteen other large cities with branches and distributors totaled 179,000. In Detroit the showing was at the General Motors Building and by nine dealers, with a total of 35,000 attendance for the ten places. In 1500 cities and towns, with populations of 5000 to 250,000, a total of 500,000 is claimed. At Flint, the home of the factory, more than 15,000 saw the new car. Saginaw had 9000 visitors and Bay City more than 5000.

As a result of the great stimulation in business resulting from this display, Sales Manager Strong announced that the factory would be put in maximum production in the shortest possible time. Many dealers have reported taking orders for the entire August allotment during the first four days of the month. The even distribution of orders indicates sound business conditions throughout the country, it is pointed out.

Hendee Announces Prices for Indian Motorcycles

SPRINGFIELD, MASS., Aug. 8—The Hendee Manufacturing Co. announces prices for the Indian Motorcycle, 1924 models, as follows:

Scout	\$290
Big Chief, No. 74	348
Chief, No. 61	335
Standard	320
Scout Service Car, including van	380
Princess Sidecar	105

These prices mark an advance of \$5 on the Indian Scout, \$3 on the Indian Big Chief, No. 74; \$10 on the Indian Chief No. 61; and \$10 on the Indian Standard. The Princess Sidecar is the same as before.

COURT ORDERS PARENTI TO PAY

BUFFALO, Aug. 6—In an order recently handed down in Federal court by

Judge John R. Hazel, William W. Reilly and the Marine Trust Co., as receivers for the Parenti Motors Co., were directed to pay \$7,500 to the People's Bank of Buffalo as part payment on a \$75,000 mortgage on the property of the defunct automobile company. The Parenti company was sold several months ago to the Hanover Motor Car Co. of Pennsylvania for \$227,500.

INDUSTRIAL NOTES

The Schlangen Bros. Co., manufacturer of brass goods and specialties, is to remove from Chicago to Rock Island, Ill., according to the Chamber of Commerce, which has been negotiating for the change several weeks. The company was formed in 1917 with \$50,000 capital but will offer \$100,000 new stock in Rock Island to provide for factory expansion. It will establish a factory 80x200 with a warehouse 20x170. A force of 150 will be employed.

International Harvester Co. has made initial shipments of trucks from its new Fort Wayne, Ind., plant. Construction work on the new plant is not yet completed but expectations are that work will be finished by late fall. Assembling of trucks will be increased as the building progresses.

Wayne Tank & Pump Co. will start construction of two new additions to their Fort Wayne, Ind., plant, at an approximate cost of \$80,000. These additions will be completed by the middle of October. New construction was made necessary by congested conditions at the plant.

Working Classes Paige's Best Customers in July

DETROIT, Aug. 6—Sales of Paige-Jewett cars in July as reported by the market research department of the company, show foremen, machinists, miners, mill workers and laborers to be the largest buying class, accounting for 13.5 per cent of the total sales, with merchants and building trades second each with 8 per cent, and women third with 7.4 per cent. Farmers with 5.4 per cent rank next below executives and manufacturers, who bought 7.2 per cent.

In comparison with June figures these leading classes show a drop of 2 per cent for the first class named, which led in June with 15.5. Merchants increased from 7.4; building trades from 6.6; women from 3.5; executives and manufacturers from 5, and farmers decreased from 6.6 per cent.

The complete list of July sales by occupations is as follows: Foremen, mechanics, etc., 13.5; merchants, 8; building trades, 8; women, 7.4; executives, 7.2; farmers, 5.4; salesmen, 4.3; real estate and insurance, 3.5; railroad men, 3.3; clerks, 2.9; garage and accessories, 2.5; hotel, restaurant, 1.9; government, 1.8; grocery and meats, 1.7; engineers, 1.6; bankers and brokers, 1.6; physicians, 1.3; retired, 1.3; taxi and livery, 1.3; lawyers, .9; bakers, .8; drugs, .8; miscellaneous, .6; occupation not given, 13.

METAL MARKETS

While there has been no outward change in steel market conditions, sentiment, if altered at all, may be said to have taken a turn for the better. Nothing has happened to add to the gloom, and several incidents, in themselves insignificant, can be taken as a slight rift in the clouds. Sheet rollers report that the automotive industries are calling for heavier deliveries than anticipated for this time of the year. Body builders are said to be eager to get more sheets into their plants so as to be prepared for a steadily mounting output of 1924 models. One automotive consumer is spoken of in the trade as having asked to have an additional fair-sized tonnage of sheets sandwiched in between shipments of sheets coming to him on account of old standing contracts. While sheet buying on the whole continues considerably below the rate at which sheets are being shipped by the mills, sales managers profess to see a revival in the interest taken in the market by automotive purchasing agents.

Some business in cold-finished steel bars for automotive requirements is also reported to have been closed, the result of price concessions being said to range from \$1 to \$2 per ton, made by several of the smaller mills specializing in cold-finished bars. Merchant bar mills which furnish the cold-finished bar makers their hot-rolled raw material have recently promulgated a new \$3 extra on screw stock, but apparently some of the cold-finished bar makers have still material at old prices due them on contracts. Although changes in the pig iron market seldom have any immediate effect on the steel situation, the sentimental effect of the end of the pig iron market's downward trend is not to be ignored. There is very little bargain hunting by buyers in evidence. Consumers are apparently disposed to let things run their natural course and to refrain from anticipating their wants, even though they might save considerable money. When the reawakening in the demand does come, there will be an order here and an order there, until finally it will be apparent that once more buyers have entered the market in unison. The early comers will not suffer by this, but those who consider it to their best interest not to place orders for steel until they can no longer defer doing so, must be prepared to face a rising market, even though demand on the whole may not make a very spectacular showing.

Pig Iron—The market has taken on a different complexion, and where a few weeks ago one decline followed another, blast furnaces and sales agencies are now showing considerable reservedness in booking orders at prevailing market prices.

Aluminum—Odd lots of foreign aluminum, some of it Norwegian and Swiss, continue to pass through the Customs House, but most of this metal had been sold before shipment from abroad. What little demand is not covered by existing contracts is easily satisfied from resale lots.

Copper—Domestic consumers show slightly more interest, but the market is far from brisk.

Tin—Statistical improvement resulted in a bit firmer tone, but on the whole the market's trend is still utterly dependent upon the outcome of the Anglo-French embroglio.

Lead—The lead situation appears to have settled down, with the market quiet and steady to firm.

Zinc—Domestic demand is lacking and the market very easy.

Calendar

SHOWS		cycles and Accessories, Grand Palais.		and Motor Boats, Aviation Palace.		Farm Equipment Manu- facturers, Hotel Statler.	
Nov. 4-10	New York, First Automobile Exposition of the Foreign Automotive Association, Hotel Astor.	Oct. 15-20	London, "Motorcycle Show, Olympia.			Nov. 12-17	Chicago, Annual Business Exhibit and Con- vention of the Automotive Equipment Association, Coliseum.
Nov. 11-17	New York, Annual Automobile Salon, Hotel Commodore.	Oct. 24-Nov. 2	Paris, Trucks, Agricultural Tractors, etc., Grand Palais.	Sept. 3	Annual Pikes Peak Hill Climb.		
Jan. 26-Feb. 2	Chicago, Annual Automobile Salon, Hotel Drake.	Nov. 1-15	Buenos Aires, An- nual Automobile Expositi- on, under the direction of the Automovil Club Argentino.	Oct. 28	Barcelona, Spain, Grand Prix for vehicles of 1500 c.c.; Nov. 1, International Grand Prix for cycle cars of 1100—Nov. 4, Interna- tional Grand Prix for two liter.		
FOREIGN SHOWS		Nov. 2-10	London, Automobile Show, Olympia.	RACES		S. A. E. MEETINGS	
Sept. 28-Oct. 7	Berlin, Auto- mobile Show.	Nov. 22-Dec. 1	London, Motor Transport Exhibition.	Oct. 24-26	Cleveland, Thirtieth Annual Convention of the National Association of	Oct. 25-26	Production Meeting of the S. A. E.—Cleveland.
Oct. 4-14	Paris, Passenger Cars, Bicycles, Motor-	Dec. 8-19	Brussels, Passenger Cars, Trucks, Airplanes			Jan. 1924	Annual Meeting of the S. A. E.—Detroit.
				CONVENTIONS		MEETINGS	
						Sept. 19-21	Boston, Fall Meeting of the Motor and Accessory Manufacturers Association.

Place Mileage Book Issue Before Court

WASHINGTON, Aug. 6—An appeal to force the railroads of the country to comply with the Interstate Commerce Commission's ruling, ordering the issuance of interchangeable mileage books, which will mean a saving of thousands of dollars annually to wholesale firms in their traveling salesmen's expenses, has been filed in the United States Supreme Court from the decision of the Federal District Court of Massachusetts, which held the I. C. C. ruling in the interchangeable mileage book case invalid.

The National Automobile Chamber of Commerce, with other automotive trade associations, has joined organizations of traveling salesmen in asking the court to enforce the order directing the railroads to issue such transportation.

The proceedings instituted by major railroads sought to have set aside the orders of the commission issued March 6, requiring them to sell interchangeable mileage books at a 20 per cent discount.

The railroads contended issuance of such books would deprive them of a reasonable return for the transportation of persons using them and would seriously impair their revenues. This view was taken by the Massachusetts court, which enjoined the commission from enforcing its order.

Federal Road Work Uses War Surplus Materials

WASHINGTON, Aug. 7—War surplus materials, including automotive equipment turned over by the War Department to the Department of Agriculture, to be used in Federal-aid highway work, total \$208,559,622, according to a report made by the Bureau of Public Roads to the department.

The figures, which include supplies turned over to the department up to July 1, this year, show that of this sum 34,589 trucks, passenger cars and motorcycles were reallocated to the States for use in their highway projects. The governmental purchase price of these pieces of automotive equipment is placed at \$78,629,800.

Since the war, according to the figures, a total of 28,005 trucks have been given to the State Highway Commissions of the various States, these having an estimated value of \$65,618,500. Passenger cars turned over to the various States total 4595, having a value of \$12,414,600, while motorcycles to the number of 1989, valued at \$596,700 have been furnished the various States.

Texas and New York were the two largest beneficiaries under the allocations to States of the war surplus supplies, each receiving in excess of \$11,000,000 worth to date. The former received 1806 trucks and passenger cars, while the latter received 1754.

New M. B. Automotive Corp. to Begin Bus Production

NASHVILLE, TENN., Aug. 7—The new motor bus plant to be established at the Old Hickory powder plant here by M. B. Bollstrom and associates will be known as the M. B. Automotive Corp. of Delaware, according to the company's charter recently filed. The capitalization is given at \$10,000,000.

Officials further advise that the company has leased eight buildings at the plant, which are now being converted into the factory proper, and that production of buses will begin there before the end of the summer. The bus to be made at the factory will be especially adapted for passenger-carrying service, and the plant will be one of the largest of its kind in the country.

ALTOONA TRACK READY

ALTOONA, PA., Aug. 4—One of the fastest automobile tracks in the world will be opened here on Labor Day with a \$24,000 race. The mile and a quarter board oval has been under construction for months, supervised by Jack Prince, builder of the Kansas City bowl and other noted board tracks. The speedway is being built of straight-grain two-by-fours laid on edge. The big bowl rises in the middle of a great level plain, with parking space for thousands of cars inside and outside the structure. The Pennsylvania Main Line passes the gates. The William Penn Highway, Horseshoe Trail and other improved roads lead directly to the site.

Static Electricity Decision Rendered

BANGOR, ME., Aug. 6—Big gasoline companies must protect customers against fires from static electricity, according to a decision handed down by the United States Circuit Court here. The decision stated that static electricity may develop to a dangerous extent in filling a gasoline tank truck from a storage tank, if the truck is not properly grounded by a safety chain. Because of recent fires started when tank trucks were filling at stations, the decision is important.

The ruling overruled the exceptions, and the verdict stands in the suits of R. L. Pitcher and the Briggs Hardware Co. of Caribou, which were awarded damages of \$17,055 and \$6,001, respectively, against the Standard Oil Co., for the destruction of storehouse and goods burned in a fire which originated by an explosion at the tank station of the oil company adjacent to the Pitcher and Briggs property, near the Caribou railroad station.

The decision calls attention to evidence which showed that the defendant corporation was aware of the danger of static electricity. Drivers of tanks were provided with chains to form ground connection and carry off the electricity, and they were ordered to use them, but in this case failed to do so.

BILL SEEKS RAIL RELIEF

ATLANTA, GA., Aug. 7—The short-line railroad companies of Georgia and other States of the Southeast face bankruptcy and abandonment due principally to the inroads that have been made by motor bus competition in this section the past two years, according to railroad officials attending a meeting of the short-line railroads of the district, held at Macon, Ga., this month.

Bus lines have experienced so wide a development in the Southeast the past two years that they are taking hundreds of thousands of dollars in revenue that formerly went to the railroads, and the latter are seeking relief in Georgia by a bill before the State Legislature to have the bus declared a common carrier.